

## Round # 1 1<sup>st</sup> Section Toss-up Questions

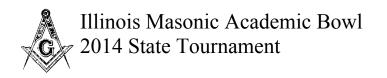
#### **Question #1: Literature – British Literature**

10 points

This poem describes stars that "threw down their spears, and	"The <u>Tyger</u> "
watered heaven with their tears." In this poem, when the	
title creature's heart began to beat, the speaker asked "what	
dread hand and what dread feet?" The speaker also asks if	
the maker of the lamb also made the title predator. Name	
this poem about an animal "burning bright in the forests of	
the night' that is in the collection <i>Songs of Experience</i> by	
William Blake.	

# **Question #2: Science – Astronomy**

One of the dark features on the surface of this object is	<u>Titan</u>	
Ontario Lacus [LAH-koos], and some of its bright locations		
are Dilmun, Adiri, and Xanadu. The dark objects are		
believed to be hydrocarbon lakes, as opposed to the water		
ice which makes up much of this object. Its Xanadu region		
is close to where the Huygens [HOY-gens] probe landed in		
2005. After our moon and the Galilean [gal-uh-LAY-un]		
moons, this was the first moon discovered, and this has the		
densest atmosphere of all satellites in our solar system.		
Name this large moon of Saturn.		



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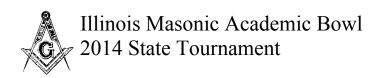
# **Question #3: Miscellaneous – Pop Culture**

10 points

In one film, this actor delivered the line, "What we do in life	Russell <u>Crowe</u>
echoes in eternity." This person starred as a programmed	
serial killer being pursued by Denzel Washington in	
Virtuosity. He earned Oscar nods for playing Jeffrey Wigand	
and John Nash in <i>The Insider</i> and <i>A Beautiful Mind</i> . In <i>Man</i>	
of Steel, he played Jor-El, the father of Superman, and in an	
upcoming film he will play Noah. Name this actor from New	
Zealand who starred as Maximus in <i>Gladiator</i> .	

# **Question #4: Social Studies – U.S. History**

Current promulgators of this law are relying on precedents	Equal Rights Amendment (accept
set by Dillon v. Gloss and Coleman v. Miller in pursuing a	ERA)
"three-state strategy." This law was originally named for	
Lucretia [loo-KREE-shuh] Mott by its author Alice Paul,	
and it faced strong opposition from Phyllis Schlafly. Despite	
a three-year extension, this did not meet the 38-state	
requirement for ratification by June 1982. Name this failed	
amendment that would forbid discrimination of any kind on	
the basis of gender.	



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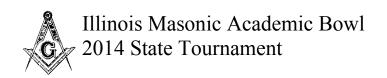
# **Question #5: Literature – Mythology**

10 points

This character met Eldir in the forest after he was driven	<u>Loki</u>	
away for killing Fimafeng [FEE-mah-fayng]. Odin claimed		
that this god lived under the earth for eight winters. Before		
declaring that Aegir [AE-jir] could never give a feast again,		
this character criticized Idun [EE-doon] for embracing her		
brother's killer. He handed Hodur [HODE-ur] enchanted		
mistletoe and aimed it at Baldr [BAL-dur], killing the god.		
He is the father of Fenrir and the mother of Sleipnir		
[SLAYP-nir]. Name this Norse trickster god.		

# **Question #6: Science – Biology**

	. 0 10011110
Some of the hormones produced by this gland are derived	thyroid gland
from tyrosine [TIE-ruh-seen], and another hormone is	
produced in this gland's parafollicular C cells. This gland is	
overactive in people with Graves' disease, which can lead to	
bulging eyes. Responsible for secreting calcitonin	
[kal-sih-TOE-nin], this gland is swollen in people with	
iodine deficiencies that cause goiter. Name this gland that	
surrounds the trachea [TRAY-kee-uh] just below the	
Adam's apple in the neck.	



# **Question #7: Mathematics – Probability**

10 points per part

Thi	s problem is named for an 18 <sup>th</sup> century Frenchman.	
1	Name this problem in which an object was repeatedly dropped on a floor with regularly sized strips.	Buffon's needle problem (prompt partial answer)
2	If the needle is shorter than the strips, the probability of the needle touching two strips equals two times the needle length divided by this number times the strip width. This number also equals the ratio of the circumference to the diameter of a circle.	<u>Pi</u>
3	Because it measures pi based on a random process,  Buffon's [boo-fon's] needle is one of these types of problems named for a region in Monaco.	Monte Carlo (accept additional words)

# **Question #8: Mathematics - Probability**

unio	e inequality named for this person, also known as the on bound, says the probability of at least one event urring is less than or equal to the sum of the individual babilities.	
1	Name this mathematician whose namesake algebra has variables that can only equal zero or one.	George <u>Boole</u> (or <u>Boole</u> 's inequality, prompt on "Boolean")
2	If six variables are independently set equal to either zero or one with equal probabilities, what is the probability that all six will equal one?	<u>1/64</u> (or 0 <u>.015625</u> )
3	If the variables x, y, and z are independently set equal to zero or one with equal probabilities, what is the probability that at least one of x or y or z equals one?	<u>7/8</u> (or 0 <u>.875</u> )

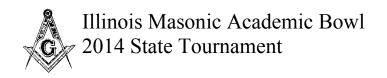
#### **Question #9: Literature – World Literature**

10 points per part

	one tale in this collection, the daughter of a king marries nephew of moneylenders instead of a king of Scotland.	
	Name this work in which each of the ten central	The <u>Decameron</u> (or Book of <u>Prince</u>
1	characters is made king or queen for a day. One of its	Galehaut or Decamerone)
	tales concerns a pot of basil.	
	This author of <i>The Decameron</i> wrote of a woman who	Giovanni <b>Boccaccio</b>
2	fell in love with a merchant in <i>The Elegy</i> [el-uh-jee] of	
	Lady Fiammetta [fyahm-MEHT-tah].	
	In the introduction, Boccaccio [boe-KAH-chyoe]	Queen <b>Guinivere</b>
3	claimed that the text was written for women who stayed	
	home, comparing them to this legendary queen.	

#### **Question #10: Literature – World Literature**

Upo	on seeing this woman, one author claimed that his vital	
spirit trembled, his animal spirit was amazed, and his natural		
spir	it wept.	
	Name this woman who was shown a fiery object by	Beatrice Portinari (accept either
1	Love and told to "behold your heart." She then ate the	underlined part)
	object.	
	Name this poet who wrote as though he was guided by	<b>Dante</b> Alighieri (accept <b>Durante</b>
2	Virgil and Beatrice in <i>The Divine Comedy</i> .	Alagherius, prompt on "Alighieri"
		or "Alagherius")
	Before ascending the mountain of Purgatory, Dante	<u>seven</u>
2	[DAHN-tay] is given this many marks on his forehead.	
3	As Dante ascends each level, one of the marks is	
	removed.	



# **Question #11: Science – Physics**

10 points per part

Thi	s is the emission of electrons caused by photons.	
1	Name this effect whose explanation won a Nobel Prize for Albert Einstein.	Photoelectric Effect
2	Einstein's explanation built on Max Planck's [plahnk's] work explaining the radiation of this type of idealized object that absorbs all incident electromagnetic radiation.	<u>blackbody</u> (accept longer answers)
3	If the photon has a very high amount of energy, it can have this reaction with the nucleus of an atom, creating an electron instead of releasing one.	pair production (accept other word forms)

# **Question #12: Science – Physics**

	s leading explanation for this phenomenon used to be S theory, but that theory does not work in some cases.	
1	Name this complete lack of electrical resistance.	superconductivity (accept other word forms)
2	BCS theory claimed that electrons were bound together in a pair named for this scientist.	Leon <u>Cooper</u> (or <u>Cooper</u> pairs)
3	The tunneling of Cooper pairs across a link between two superconductors is named for this scientist.	Brian David <u>Josephson</u> (allow additional words such as effect or junction)

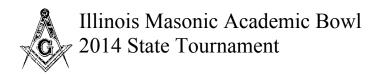
# **Question #13: Social Studies – Psychology**

10 points per part

	s field of psychology drew on structural psychologist wald Kulpe's [kul-peh's] ideas of imageless thoughts.	
1	Name this field of perception theory which holds that the whole is greater than the sum of its parts. Kulpe oversaw the dissertation of one of its founders, Max Wertheimer.	Gestalt psychology
2	An object often discussed in Gestalt theory is one of these shapes designed by Louis Necker. Objects are passed through it to show the different two-dimensional perspectives.	<u>cube</u>
3	Another classic image discussed in Gestalt theory is that of the ambiguous image of two faces and one of these objects.	vase

# **Question #14: Social Studies – Psychology**

	one controversial experiment, this person raised infant caques [mah-KAKS] in total isolation for two years.	
1	Name this formulator of the "learning to learn" theory who ran one experiment that led to some subjects becoming "motherless mothers."	Harry <u>Harlow</u>
2	In the experiment that led to the "motherless mothers," Harlow created two artificial surrogates to mother these animals. Macaques are examples of these animals.	monkeys (prompt on "mammal"s or "primate"s)
3	In another experiment, Harry Harlow developed these surrogate mothers that stabbed with sharp spikes or blew out a forceful blast of cold air. Surprisingly, the babies still clung to them.	<u>iron maiden</u> s



## Round # 1 3<sup>rd</sup> Section Toss-up Questions

# **Question #15: Science – Chemistry**

10 points

In contrast to the Helmholtz free energy, the Massieu	entropy
[mas-syoe] potential is also known as the Helmholtz free	
amount of this quantity. The amount of this added to a	
system is calculated in the Clausius inequality, and this	
value is maximized at equilibrium. This equals the	
reciprocal of temperature integrated with respect to energy,	
and this is proportional to the log of the number of states a	
gas can occupy. Name this quantity which, according to the	
Second Law of Thermodynamics, never decreases in an	
isolated system.	
•	

#### **Question #16: Social Studies – Economics**

Per the Humphrey-Hawkins Act, this body is required to	Federal Reserve Bank of the
submit a semiannual report on the goal of full	United States
employment. The Consumer Advisory Council formerly	
within this was subsumed by the Consumer Financial	
Protection Bureau. Its primary policymaking body is the	
Open Market Committee. This body also oversees the	
majority of Automated Clearing House transactions,	
including Social Security payments and tax refunds. Name	
this American central banking authority.	

### Round # 1 3<sup>rd</sup> Section Toss-up Questions

#### **Question #17: Mathematics – Math Concepts**

10 points

One of these structures that applies the fundamental theorem of arithmetic is named for Peter Shor. Donald Knuth [keh-NOOTH] designed one of these for matrices named X. One of these that is used for the shortest path problem is named for Edsger Dijkstra [DIKE-strah]. The worst-case complexity of these is described by big O [oe] notation. Name this type of construct often converted into a computer program which gives a procedure for solving a problem or carrying out a task.

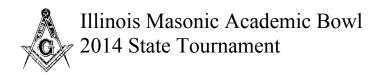
algorithms (accept quantum algorithm before the end of the 2nd sentence, prompt on "method"s, "technique"s, or "process"es)

#### **Question #18: Social Studies – World History**

10 points

During this war, the cruiser *Novik* [NOE-veek] was lost at the Battle of Korsakov. That happened soon after Feodor Keller lost the Battle of Motien Pass. One fleet in this conflict had sailed from the Baltic in an attempt to reach Port Arthur, but was defeated at Tsushima [tsoo-SHEE-mah] Strait by the forces of Togo Heihachiro [toe-goe hay-hah-CHIH-roe]. Concluded via the Treaty of Portsmouth, which was mediated in part by Teddy Roosevelt, name this war fought in the early 20<sup>th</sup> century.

#### Russo-Japanese War



## Round # 1 3<sup>rd</sup> Section Toss-up Questions

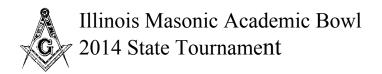
# **Question #19: Fine Arts – Art History**

10 points

This artist included two floating stepping stools and the title	Salvador <u><b>Dali</b></u>	
figure hovering above a floating pedestal in front of a swan		
in his work <i>Leda Atomica</i> [LAY-dah ah-TAH-mih-kah].		
That work used his wife Gala [GA-lah] as a model, as did		
his work Galatea of the Spheres. His work showing skulls		
within the eye sockets and mouths of larger skulls is <i>The</i>		
Face of War. He showed ants crawling inside an orange		
timepiece in a work that included several other timepieces.		
Name this Spanish surrealist who painted <i>The Persistence of</i>		
Memory.		
·		

#### **Question #20: Literature – U.S. Literature**

This author wrote of an American sculptor who fell for the	Henry <u>James</u>
daughter of a <i>Cavaliere</i> [ka-vah-lee-EHR-ay], but died on	
his way to see her in Interlaken [in-ter-LAH-ken]. In	
another novel, he wrote of a protégé [PROE-teh-jay] of	
Olive Chancellor who is conscripted into the women's	
rights movement, but Verena falls for Basil. This author of	
Roderick Ransom and The Bostonians penned a novella	
concerning the pursuit by Giovanelli [jyoe-vah-NEL-lee]	
and Winterbourne of an American tourist. Name this author	
of The Turn of the Screw and Daisy Miller.	
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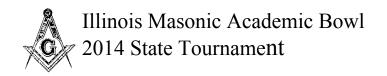
# **Question #21: Mathematics – Algebra**

10 points per part

	ese types of sequences follow patterns of exponential wth or decay.	
1	Name this type of sequence in which each number equals a constant times the previous number.	geometric (sequence or progression) (do not accept "geometric series")
2	If the third term of a geometric sequence is 64 and the common ratio is 2, what is the value of the first term?	<u>16</u>
3	If a geometric series has a first term of 10 and a common ratio of one-third, what is the value of the limiting sum?	<u>15</u>

# **Question #22: Mathematics – Algebra**

1		s structure has a set and an operation that satisfies its four lesake axioms, and it has commonalities with a ring or a d.	
	1	Name this mathematical structure that is closed under an associative operation that has an identity, and in which every element has an inverse.	<u>group</u> s
	2	Rings are groups with an additional operation, which has this property over the group operation.	distributive property (accept distributivity)
	3	Find the answer to this arithmetic problem that is easier to solve if you take advantage of the distributive property: the quantity 72 times 13 end quantity plus the quantity 72 times 7.	1440



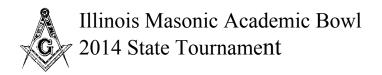
# **Question #23: Fine Arts – Classical/Opera**

10 points per part

Thi	s composer wrote several humoresques, including one	
that	was given lyrics starting with, "Passengers will please	
refr	ain."	
	Name this Czech composer whose ninth symphony was	Antonin <b><u>Dvořak</u></b> (be lenient, but
1	nicknamed "From the New World."	the pronunciation should be
		dvorjahk)
	Dvořak wrote this set of sixteen nationalist pieces,	Slavonic Dances (or Slovanske
2	finishing eight of them in 1878 and the other eight in	<u>tance</u> )
	1886.	
	Dvořak gave this Slavic subtitle to his fourth piano trio.	" <u>Dumky</u> " (or " <u>Dumka</u> ")
3		

# **Question #24: Fine Arts – Classical/Opera**

	is composer is credited with 106 symphonies, including a	
gro	oup of six known as his Paris symphonies and a group of	
two	elve known as his London symphonies.	
	Name this Austrian composer also credited with 68	Joseph <u>Haydn</u> (be lenient, but the
1	string quartets, including a group of six known as	pronunciation should be HIE-den)
	Russian and a group of six known as Prussian.	
	Near the end of the first performance of this Haydn	<u>Farewell</u> (or <u>45</u> <sup>th</sup> )
2	symphony, the musicians one by one blew out a candle	
	and left the stage.	
	Haydn also wrote 45 of these pieces, including three	piano trio (prompt partial answer)
3	dedicated to Theresa Jansen Bartolozzi and one	
	nicknamed "Gypsy" that ends with a rondo.	



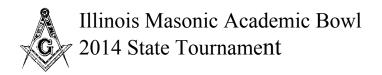
# **Question #25: Social Studies – World History**

10 points per part

He	replaced Edward Gierek [GEER-ek] as the leader of his	
nati	on's Communist Party, also known as the United	
Wo	rkers' Party.	
	Name this leader whose imposition of martial law led	Wojciech Witold Jaruzelski
1	to nine miners being killed during a strike at the Wujek	
	[VOO-yek] coal mine.	
	This labor leader helped Tadeusz Mazowiecki	Lech Walesa
2	[tah-DAY-ooz mah-zoe-vee-EHS-kee] become prime	
	minister before succeeding Jaruzelski	
	[ha-roo-ZEL-skee] as president in 1990.	
	Lech Walesa founded this nation's Solidarity Party. As	<b>Poland</b>
3	a union leader, Walesa became the figurehead for the	
	1980 Gdansk shipyard strike.	

## **Question #26: Social Studies – World History**

	was the target of an assassination plot concoted by his er Lucilla [loo-CHEEL-lah].	
1	Name this Roman emperor who renamed the capital as his "Colony." He was assassinated by a wrestler after he announced that he would assume the consulship in gladiatorial garb.	Caesar Marcus Aurelius  Commodus Antoninus Augustus (accept Lucius Aelius Aurelius  Commodus)
2	Commodus was co-ruler with this emperor, his father, who died campaigning against the Germanic tribes in 180 AD.	Caesar Marcus Aurelius Antoninus Augustus (accept Marcus Annius Verus)
3	Marcus Aurelius was the last of this succession of emperors that began with Nerva and included Trajan and Antoninus Pius.	Five Good Emperors



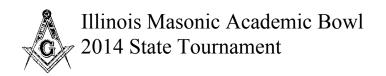
#### **Question #27: Literature – British Literature**

10 points per part

The	speaker in this poem can be found in a dive on 52 <sup>nd</sup>	
Stre	eet.	
	In this poem, Thucydides [thoo-SIH-dih-dees] is cited	"September 1, 1939"
1	as an expert on "democracy, and what dictators do."	
1	The speaker claims to only have "a voice, to undo the	
	folded lie."	
	"September 1, 1939" was penned by this co-librettist on	Wystan Hugh <u>Auden</u>
2	The Rake's Progress and poet of "Musee de Beaux	
	Arts."	
	Inspired by his translations of Dag Hammarskjold's	<b>haiku</b> s
	[HAM-mur-skyold's] journals, Auden wrote in this	
3	poetic form in "Symmetries and Asymmetries" and the	
	collection Marginalia. Japanese poet Mastuo Basho	
	was a major proponent of this form.	

## **Question #28: Literature – British Literature**

	he opening to this play, Ariel warns the female tagonist to beware of jealousy, pride, and men.	
1	In this play, Lord Petri compared the steel of scissors to Greek swords after committing the title action.	The Rape of the Lock
2	The Rape of the Lock was written by this author of The Dunciad [DUN-see-ad] and An Essay on Man.	Alexander Pope
3	In the end, Belinda's cut lock of hair becomes one of these objects, as observed by the muse of poetry.	star



## Round # 1 5<sup>th</sup> Section Toss-up Questions

#### Question #29: Social Studies – U.S. History

10 points

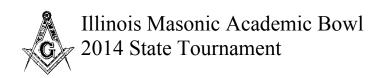
This person's namesake commission led to the creation of	Herbert Clark <b>Hoover</b>
the Department of Health, Education, and Welfare. This	
person claimed to be the first Stanford University student,	
and a library he started there is now a think tank. He	
oversaw the creation of the Reconstruction Finance	
Corporation to stabilize the economy, but he did indelible	
damage after signing the Hawley-Smoot Tariff, later	
claiming that, "Prosperity is just around the corner." Name	
this President who was succeeded during the Great	
Depression by Franklin Roosevelt.	

#### **Question #30: Mathematics – Math Concepts**

10 points

This is the expected value of money won in which a gambler receives two raised to the k minus one dollars if it takes k coin flips for the first tail to appear. Hilbert's Paradox of the Grand Hotel addresses sets of this size, and this is the surface area of Gabriel's Horn and the perimeter of a Koch [koach] snowflake, which is a type of fractal. The symbol aleph-null is used for the countable version of this value. Name this value that is large beyond any limit.

infinity (or infinite or unbounded, accept "countable" before it is mentioned, prompt on "undefined")



### Round # 1 5<sup>th</sup> Section Toss-up Questions

#### **Question #31: Literature – World Literature**

10 points

In one poem, this writer described the "infinite oblivion" shattering a woman, which held "infinite tenderness, like a jar." He also described a time that "cold stars heave up, black birds migrate;" that being the hour of departure. This writer compared the stabbing of knives to "an Amazon of buried jaguars" in a poem whose speaker asked his brother to "arise to birth with me." Name this writer of "The Song of Despair" whose *Canto General* [hen-er-AHL] includes *The Heights of Macchu Picchu*, a Chilean poet.

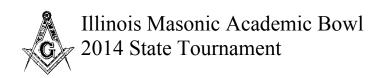
Pablo <u>Neruda</u> (accept Ricardo Eliecer Neftalí <u>Reves</u> Basoalto)

### **Question #32: Science – Physics**

10 points

This scientist and Hendrika Johanna van Leeuwen
[LAY-ven] discovered independently that classical physics could not explain the spontaneous magnetization of iron. A conference he spoke at in Gottingen [GOE-tin-gen] in 1922 became known as his festival and was where he met his future student Werner Heisenberg. His interpretation of quantum mechanics allowing mutually exclusive measurements was known as complementarity and became known as the Copenhagen Interpretation. Name this physicist who explained energy levels using circular orbits in his model of the hydrogen atom.

1	6



# Round # 1 Extra Section Toss-up Questions

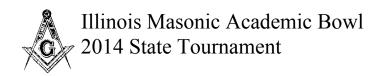
# Extra Question #1: Social Studies – World History

10 points

Its emblem quoted Psalm 73, "Rise Up, O Lord, and Judge	Spanish <b>Inquisition</b>
Thine Own Cause!"Among its appointed leaders was St.	
Peter of Arbues [AHR-bwehs], who was later killed by	
marranos. Thrice it issued edicts against the mystical	
Alumbrados, and it also martyred <i>moriscos</i>	
[moe-REE-skoes]. Overseen by Tomas de Torquemada	
[tor-kay-MAH-dah], name this group which prosecuted	
alleged heretics, begun during the reign of Ferdinand and	
Isabella.	

## Extra Question #2: Science – Biology

This scientist worked with Charles Manning Child to show	Thomas Hunt Morgan	
that a small piece of a planarian [pluh-NAR-ee-un] could		
regenerate an entire organism. Following the work of		
William Bateson, this scientist found that coupling and		
repulsion are incomplete, and before the work of Barbara		
McClintock, he explained Janssens' discovery of crossover.		
The unit measuring genetic linkage is named for him, and he		
demonstrated that a white eyed mutation is sex-linked.		
Name this scientist famous for his work on Drosophila		
[dro-soe-FEE-lah] melanogaster, or fruit flies.		



# Round # 1 Extra Section Toss-up Questions

#### Extra Question #3: Literature – U.S. Literature

10 points

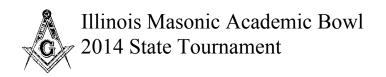
This author described a gangster utilizing weather	Truman <u>Capote</u>
descriptions to send messages from Sing Sing prison. He	
wrote of an author who rode horses through Central Park	
before a love interest planned to leave the country with Jose	
Ybarra-Jaegar. This novelist also wrote of Alvin Dewey's	
investigation into the murder of the Clutters by Dick	
Hickock and Perry Smith. Name this author of <i>Breakfast at</i>	
Tiffany's and In Cold Blood.	

#### Extra Question #4: Mathematics – Math Concepts

10 points

One way to create these things is to use Fermat's [fehr-mah's] method of infinite descent, which was applied by Euler [OY-ler] to Fermat's theorem on the sum of two squares. One type of these things has a strong, or complete, variant in which an assumption applies to a set of numbers instead of just one. That type, which includes a basis step, is induction. The indirect type of this uses reductio ad absurdum, building a contradiction. Name this argument establishing a truth that can come in the form of a paragraph or two columns.

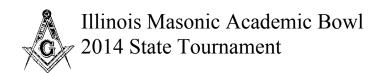
proofs (accept inductive proof or proof by induction, prompt on "induction")



# Round # 1 Extra Section Toss-up Questions

# Extra Question #5: Fine Arts – Classical/Opera

This composer wrote a choral work about an Indian poet	Gustav von <u>Holst</u>
who sends a message to his wife, The Cloud Messenger. A	
few years later, he used the gospels for <i>The Hymn of Jesus</i> .	
The first public performance of one of this composer's	
pieces was conducted by Adrian Boult, and its last section	
uses two women's choruses in an adjoining room. That	
work was originally titled Seven Pieces for Large	
Orchestra, and its last section is "The Mystic." Name this	
composer who used astrology themes in his work <i>The</i>	
Planets.	



# Round # 1 Extra Section Teamwork Questions

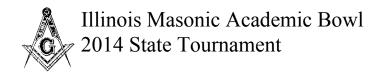
# Extra Question #6: Social Studies – U.S. History

10 points per part

Не	led his party's delegation to the 1865 Hampton Roads	
Coı	nference.	
	Name this author of A Constitutional View of the Late	Alexander Hamilton Stephens
1	War Between the States. After seven states seceded	
	from the Union, he gave the "Cornerstone Speech."	
	Alexander Stephens was elected to this post in the	Vice President
2	Confederacy. He had a strained relationship with	
<b>Z</b>	Jefferson Davis, calling him "a weak timid aspirant for	
	military domination."	
	After the Civil War, Stephens served as a congressman	Georgia
3	and later governor of this state originally started as a	
	colony by James Oglethorpe.	

# Extra Question #7: Social Studies – U.S. History

	e plaintiff in this Supreme Court case was a minor who a targeted for wearing a black armband.	
1	Name this case for which Abe Fortas wrote a majority opinion that criticized the arbitrary nature of a ban on the armband, as it did not extend to buttons or Iron Crosses.	<u>Tinker</u> vs Des Moines
2	The protest in question took place within this establishment. <i>Tinker</i> established the precedent that those within it do not lose all rights upon entering through its "gate."	high <u>school</u>
3	The black armbands targeted by the unconstitutional ban were worn in 1965 in protest against this conflict.	<u>Vietnam</u> War



# Round # 1 Extra Section Teamwork Questions

# Extra Question #8: Science – Chemistry

10 points per part

	s is the second most abundant gas in the universe, but re is very little in Earth's atmosphere.	
1	Name this lightest noble gas.	<u>helium</u>
2	Helium was the first element observed in this state, a liquid with no viscosity.	<u>superfluid</u> ity
3	This name is given to a transition point between fluid helium and superfluid helium, which at one atmosphere is slightly over two kelvin.	<u>lambda</u> point

## Extra Question #9: Science - Chemistry

	element 106 is now named for him.	
1	Name this chemist who shared a Nobel Prize with Edwin McMillan.	Glenn <u>Seaborg</u>
2	Most of Seaborg's discoveries, but not seaborgium, are in this series on the periodic table below the lanthanides.	<u>actinide</u> s
3	Seaborg named this set of isotopes that he believed would have longer half-lives than the ones he discovered. These isotopes have not yet been created.	island of stability

### Round # 2 1<sup>st</sup> Section **Toss-up Questions**

#### **Question #1: Social Studies – World History**

10 points

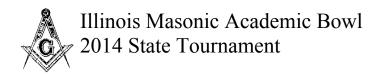
This nation was the site of an uprising led by Juhayman al-Utaybi [joo-HAY-mahn ahl oo-TIE-bee], who accused this country's leaders of being Christian allies. It secured its region of Asir following a 1934 war in the Treaty of Taif. 19 Americans were killed in 1996 in the Khobar Towers bombing in this country. On top of fiercely defending its town of Ras al-Khafji [rahs ahl KAHF-jee], it coordinated the victorious Muslim forces of the Persian Gulf War. This was formed by the union of the Hejaz [hay-jaz] and Najd [nehjd] kingdoms, and it was the home country of most of the 9/11 terrorists. Name this Middle East kingdom with capital at Riyadh.

Kingdom of Saudi Arabia (accept Al-Mamlakah al-'Arabiyyah al-Su'ūdiyyah)

### **Question #2: Mathematics – Math Concepts**

10 points

This is the number of faces of a truncated tetrahedron. The 8 Platonic [plah-TAH-nik] solid with this number of faces has six vertices [VER-tuh-sees], and the Platonic solid with this number of vertices has six faces. This is the number of sets in a power set developed from a set with three elements, and this is the Fibonacci [fih-buh-NAH-chee] number between 5 and 13. A polygon with this number of sides is created by making straight cuts at the corners of a square. Identify this power of two, equal to the number of sides of an octagon.



## Round # 2 1<sup>st</sup> Section Toss-up Questions

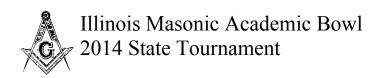
#### **Question #3: Literature – U.S. Literature**

10 points

This author wrote a short story in which a man built an	Ray <b>Bradbury</b>	
exact replica of the mansion from "The Fall of the House of		
Usher." The prologue to one of his novels describes		
Halloween occurring at 3 AM on October 24. That novel		
described the arrival of the Pandemonium Shadow Show to		
Green Town. This author of Something Wicked This Way		
Comes wrote of atomic war survivors as "living books" that		
escaped the Mechanical Hound. Name this author of <i>The</i>		
Martian Chronicles and Fahrenheit 451.		

# **Question #4: Science – Chemistry**

When this value is calculated for different elements,	electronegativity (accept word
hydrogen is given a value above two so that all elements	forms)
have positive values. This was calculated by taking the	
square root of the difference of a dissociation energy and the	
average of two other dissociation energies. This value	
depends largely on the number of spaces in the outer energy	
level and its distance from the nucleus. Name this value	
invented by Linus Pauling measuring the ability of an atom	
to attract electrons, a value high in fluorine.	



## Round # 2 1<sup>st</sup> Section Toss-up Questions

# **Question #5: Social Studies – Geography**

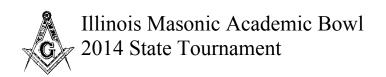
10 points

In retaking this island during World War Two, the Allies	Territory of <b>Guam</b> (accept
sprung an invasion from Apra Harbor. The Cabras and	<u>Guahan</u> )
Cocos Islands lie directly off the coast of this area. Home	
to the Andersen Air Force Base, natives of this island	
speak Chamorro, which borrows heavily from Spanish. Its	
capital is Hagatna, and this is the largest Mariana Island.	
Name this US Territory lying north of Micronesia in the	
Pacific Ocean.	

# **Question #6: Fine Arts – Classical/Opera**

10 points artholdy

This composer referenced a choral work by Bach in the last	Felix Mendelssohn Bar
of his six organ sonatas, which he wrote soon after starting	(prompt on "Bartholdy"
the Leipzig [LIPE-zig] Conservatory. He wrote eight	
volumes of six works each, some of which are known as	
Venetian Boat Songs, which he called Songs Without	
Words. A trip to Scotland inspired this composer's third	
symphony, and a trip to Italy inspired his fourth symphony.	
Name this composer whose A Midsummer Night's Dream	
includes his Wedding March.	



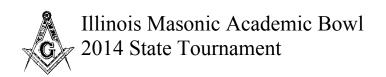
#### **Question #7: Mathematics - Statistics**

10 points per part

	swer the following about curve fitting, which is related to ression analysis and the method of least squares.	
1	This is the smallest number of points necessary to fit a cubic function to the points if you do not have additional information about the situation.	4
2	The question as to how well a curve fits points can be measured with the Pearson product-moment correlation coefficient, which is generally represented by this lower-case letter.	<u>r</u>
3	This is the value of r for a linear regression using two points when the point on the right is lower than the point on the left.	<u>-1</u>

#### **Question #8: Mathematics – Statistics**

	s statement often claims that there is no relationship	
	ween two quantities and that any measured similarities	
are	due to chance.	
1	Name this statement that typically is disproven to establish correlation.	null hypothesis
2	This type of error occurs when a false null hypothesis is not rejected.	type <u>two</u> error (or error of the <u>second</u> kind or equivalent, prompt on "false negative")
3	Bayes Theorem is sometimes used to strengthen or weaken a null hypothesis. Find the probability of B given A if the probability of A given B is 0.5, the probability of A is 0.3, and the probability of B is 0.2.	<u>1/3</u> (or 0 <u>.3 repeating</u> )



# **Question #9: Science – Biology**

10 points per part

	s is made of cisternae [sih-STER-nay] and used for kaging proteins.	
1	Identify this organelle named for an Italian scientist.	Golgi apparatus (or Golgi body or Golgi complex)
2	Proteins are taken to and from the Golgi [GOAL-jee] apparatus in these round bubbles that are natural liposomes [LIP-uh-soems].	<u>vesicle</u> s
3	While the cis [sis] face of the Golgi apparatus is the end closest to the endoplasmic reticulum, this is the end farthest from the endoplasmic reticulum.	<u>trans</u>

# **Question #10: Science – Biology**

The	ese are often shaped as spheres or rods.	
1	Name these microorganisms that are classified as gram-positive or gram-negative.	<u>bacteria</u> (or <u>bacterium</u> )
2	This Latin name is used for rod-shaped bacteria.	bacilli (or bacillus)
3	One of the types of spherical bacteria is this one whose name refers to its ability to form grapelike clusters.	staphylococcus (prompt on staph)

# **Question #11: Social Studies – Religion**

10 points per part

Thi	s set of statements was set out in the first forest sermon.	
1 2	Name this collection of declarations, which outline how life is about suffering. The last one of these addresses the Noble Eightfold Path.  The Four Noble Truths are the basic tenets of this Eastern religion. Its sects include Rinzai and Zen.	Four Noble Truths (or Catvari Arvasatvani, prompt partial answer)  Buddhism (or Buddhist)
3	In Buddhist tradition, this concept often translated as suffering is the true nature of all existence. Broken down into pain, pleasure turning into pain, and being susceptible to pain, it can be suppressed by following the Eightfold Path.	dukkha

# Question #12: Social Studies – Religion

	angel came to see him while he was on a retreat in a e on Mount Hira.	
	Name this prophet of Islam. His sayings are collected	Abū al-Qāsim Muhammad ibn
1	in the <i>hadith</i> [hah-DEETH].	'Abd Allāh ibn 'Abd al-Muttalib
		ibn Hāshim (accept Mohammad)
	This term meaning 'sacred' refers to the part of the	<u>Qudsi</u>
2	hadith that includes Muhammad's sayings.	
	This was the angel who came to see Muhammad and	Gabriel (accept Jibril or Jibrail)
3	revealed the truth about the one true God, according to	
	Islamic tradition.	

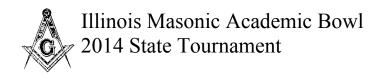
## Question #13: Literature - U.S. Literature

10 points per part

	his poem, passengers ask the conductor, "What place is? Where are we now?"	
1	Name this poem in which the title speaker asks that bodies be piled high at Gettysburg, Ypres, and Verdun, stating "shovel them under and let me work."	" <u>Grass</u> "
2	This author of "Grass" wrote of fog that comes "on little cat feet."	Carl August <u>Sandburg</u>
3	Carl Sandburg's six-volume biography of this man included <i>The Prairie Years</i> and <i>The War Years</i> .	Abraham <u>Lincoln</u>

## **Question #14: Literature – U.S. Literature**

	e central couple in this novel moved from rural Virginia Harlem.	
1	Name this novel in which Joe Trace cheated on Violet with Dorcas Manfred. After Joe shot Dorcas, Violet cut the young girl's face at the funeral.	<u>Jazz</u>
2	In this other novel, Sethe [SEH-thuh] cut the throat of one daughter with a handsaw, and almost smashed the head of Denver in order to prevent their capture by the master.	<u>Beloved</u>
3	Jazz and Beloved were both penned by this author of Song of Solomon.	Chloe Anthony (Toni) Morrison (accept Chloe Anthony Wofford)



## Round # 2 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Social Studies – U.S. History**

10 points

During the primaries, the winner of this election faced allegations involving Gennifer Flowers. The highest-finishing third-party candidate in this election featured James Stockdale on the ticket, and took almost 19% of the popular vote. To keep campaigners focused, a sign including the slogans "Don't Forget Health Care" and "the economy, stupid" was hung up by James Carville. Name the year in which incumbent George H.W. Bush lost to Bill Clinton.

1992 United States Presidential Election

## **Question #16: Science – Biology**

This organ is held in place by the falciform [FAL-suh-form]	<u>liver</u>	
ligament, and its round ligament is a remnant of the		
umbilical vein. Hemosiderin [hee-moe-SIH-deh-rin] is		
stored in this organ's Kupffer cells. This organ contains		
glucuronic [gloo-kyuh-RAH-nik] acid, which is used to		
make bilirubin [BIH-lee-roo-bin] soluble in water, which		
then goes to the gallbladder within bile. When this organ		
does not function, people's skin turns yellowish, a condition		
known as jaundice. Name this organ that filters blood and		
which is damaged in people with cirrhosis [sir-ROE-sis] or		
hepatitis.		

## Round # 2 3<sup>rd</sup> Section Toss-up Questions

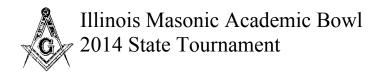
#### **Question #17: Literature – British Literature**

10 points

This poem describes the drowning of the "ceremony of	"The <b>Second Coming</b> "
innocence" by the "blood-dimmed tide." The speaker	
imagines seeing "A shape with lion body and the head of a	
man;" the "vast image out of Spiritus Mundi [SPIH-rih-toos	
MOON-dee]" troubled the narrator's sight. As "the falcon	
cannot hear the falconer" in this poem, "things fall apart, the	
center cannot hold." Name this poem by William Butler	
Yeats concerning the return of a beast.	

#### **Question #18: Miscellaneous – Consumer Education**

These are called share drafts when they are issued by	<u>check</u> s
credit unions. These are involved in the illegal act of	
kiting, which involves accounts at different financial	
institutions. Magnetic Ink Character Recognition was	
developed to facilitate the processing of these. Banks	
guarantee payment of the cashier's or certified type of this	
document. Name this common written instrument used to	
promise payment.	



## Round # 2 3<sup>rd</sup> Section Toss-up Questions

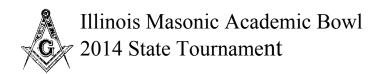
#### **Question #19: Literature – World Literature**

10 points

The protagonist of this novel receives his nickname from the family of General Epanchin. A scandal erupted following an argument between Aglaya [ah-GLIE-yah] and Natasya [nah-TAHSH-yah], who left the title character at the altar only to be killed by Rogozhin [roe-GOE-zhin]. During an introduction to local society, the main character in this novel knocked over a vase before having an epileptic fit. Name	The <u>Idiot</u>	
Fyodor Dostoyevsky.		

#### Question #20: Science - Earth Science

A formation in Texas of this type of sedimentary rock is named for John Barnett. This rock is laminated and fissile [FIH-sil], which means that this breaks into chips rather than clumps, and differentiates this from mudstones. This turns into slate when it is hardened. This rock and dolomite make up the Bakken formation in Montana and North Dakota. Name this rock that often contains kerogen [KER-uh-jen], which can be turned into a substitute for crude oil.	<u>shale</u>	
Crude on.		



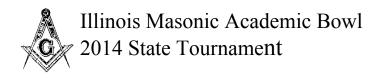
## **Question #21: Mathematics – Geometry**

10 points per part

Thi soli	s shape has the fewest number of faces of all the Platonic ds.	
1	Name this shape that can also be called a triangle-based pyramid and a three-dimensional simplex.	<u>tetrahedron</u>
2	This is the number of faces of a tetrahedron.	4
3	If a tetrahedron has an edge length of 2, this is its total surface area.	4 root 3 (or 4 times the square root of 3 or 4 radical 3 or equivalents)

# **Question #22: Mathematics – Geometry**

	y set of three points has this property, while it is netimes true for sets of four or more points.	
1	Name this property used to describe a set of objects which are all in a common flat surface.	<u>coplanar</u> ity
2	This term describes two lines that are not coplanar [koe-PLAY-nur], meaning that they do not intersect and are not parallel.	skew lines
3	Find the distance between the origin and the plane x+y+z=1. Rationalize the denominator in your answer.	root three over three (or one- third root three or radical three over three or the square root of three over three or equivalents)



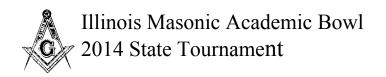
# **Question #23: Social Studies – U.S. History**

10 points per part

	in attempt to discredit this consumer advocate, General tors hired a private detective to follow him.	
1	Name this consumer advocate and founder of Public Citizen who ran for President in 2000.	Ralph <u>Nader</u>
2	Twice Ralph Nader has run for President as the candidate of this party, including 2000. It articulates its views in "Ten Key Values," which include gender equality and social justice in addition to environmentalism.	Green Party
3	Nader drew the ire of GM and other automakers after publishing this scathing attack on the industry in 1965. This book led to the government establishing safety standards for all motor vehicles in the US.	Unsafe at Any Speed

# **Question #24: Social Studies – U.S. History**

Thi	s conflict began due to a disagreement over colonial	
pol	icy regarding Native Americans, whom William	
Ber	keley wanted to open trade with.	
	Name this uprising, whose leader accused Berkeley of	<b>Bacon</b> 's Rebellion
1	playing favorites regarding trade policy.	
	Bacon's Rebellion took place within this colony, which	Virginia
2	would later be the home of Patrick Henry, James	
	Monroe, and Thomas Jefferson.	
	Berkeley tried to have Nathaniel Bacon put on trial in	House of Burgesses (prompt on
,	front of King Charles II, but this Virginia legislative	"Burgesses", do not accept "House
3	body blocked the measure. Ironically, Bacon was	of Burgess")
	elected to it, and attended the Assembly of June 1676.	,



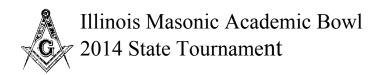
# **Question #25: Science – Chemistry**

10 points per part

Thi	s element used to be known as brimstone.	
1	Name this element below oxygen on the periodic table that is a major component of acid rain.	sulfur
2	This element combines with sulfur to form the ore galena.	lead
3	The production of sulfuric acid through the contact process commonly uses the pentoxide of this element as a catalyst.	<u>vanadium</u>

# **Question #26: Science – Chemistry**

	ne important processes in thermodynamics are hermal.	
1	This is the quantity that is held constant in an isothermal process.	temperature (do not accept "heat")
2	Isothermal processes are sometimes contrasted with these processes in which no heat goes into or out of a system.	<u>adiabatic</u>
3	While a Carnot [kahr-noe] cycle involves two isothermic and two adiabatic steps, this cycle involves two isothermic and two constant volume steps.	Robert Stirling cycle



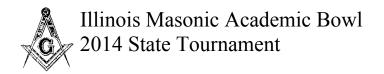
## **Question #27: Fine Arts – Art History**

10 points per part

Ide	ntify these painters who sort of were impressionists.	
	This painter tried to avoid having his works shown	Edouard Manet (do not accept
1	with impressionists, though he was friends with many	"Monet")
1	of them and influenced them. He painted <i>The Luncheon</i>	
	on the Grass.	
	This artist did join some impressionist exhibitions but	Paul <u>Cezanne</u>
1	is now usually considered to be a post-impressionist.	
2	He made several paintings of Mount Saint Victoire	
	[vik-twah] and card players.	
	This painter started out as an impressionist, but he and	Paul Signac
2	Georges Seurat started neo-impressionism with their	
3	use of pointillism. He painted <i>The Dining Room</i> and a	
	colorful portrait of Felix Feneon [feh-nay-own].	

# **Question #28: Fine Arts – Art History**

Naı	me these sculptors.	
1	This Frenchman sculpted <i>The Burghers of Calais</i> and <i>The Thinker</i> .	Auguste Rodin
2	This sculptor created <i>The Column of the Infinite</i> and <i>Bird in Space</i> .	Constantin Brancusi
3	This 18 <sup>th</sup> and 19 <sup>th</sup> century sculptor created <i>Napoleon as Mars the Peacemaker</i> and <i>Psyche Revived by Cupid's Kiss</i> .	Antonio <u>Canova</u>



## Round # 2 5<sup>th</sup> Section Toss-up Questions

#### **Question #29: Social Studies – World History**

10 points

He led his forces to victory at Mortemer and Varaville, both against an alliance between Geoffrey Martel and Henry the First. His daughter Adela was the mother of Stephen of Blois. In one battle, his horsemen twice feigned retreat before doing away with foot soldiers before his chief opponent was struck in the eye with an arrow. Name this Norman who defeated Harold Godwinson at the Battle of Hastings during his invasion of England.

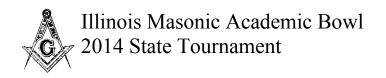
William I (accept William the Conqueror, William the Bastard, William of Normandy, Guillaume le Conquérant or Guillaume le Bâtard or Guillaume de Normandie, prompt on "William")

#### **Question #30: Science – Physics**

10 points

One of the confirmations of this experiment was performed by Gustaf Wilhelm Hammar in Idaho after this was brought into question by experiments performed by Dayton Miller on top of Mount Wilson. Originally moved from Berlin to Potsdam because of vibrations, this experiment eventually was conducted on a stone slab floating in a pool of mercury in Cleveland. Its null result was explained at first by drag but is now explained by relativity. Name this attempt to measure the luminiferous ether [loo-meh-NIH-fuh-rus EE-thur].

**Michelson**-Morley Experiment



#### Round # 2 5<sup>th</sup> Section Toss-up Questions

#### Question #31: Literature - U.S. Literature

10 points

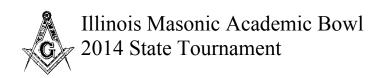
In one collection, this writer described a maid allegedly	Richard Wright	
scared by a white cow while pregnant, as well as forging a		
white man's signature to check out library books. This		
author of "The Ethics of Living Jim Crow" wrote about		
moving from Jackson to Chicago and joining the		
Communists in his autobiography. He also wrote of a		
college student who was accidentally killed by her black		
chauffeur. Name this man who wrote about Bigger Thomas		
in <i>Native Son</i> and whose autobiography was titled <i>Black</i>		
Boy.		

# **Question #32: Mathematics – Math Concepts**

10 points

Pappus' theorem is sometimes named for this point because it uses the distance traveled by this point to find a volume or surface area. The location of this point can be found by averaging the coordinates of the vertices of the shape it is associated with. This point is always twice as far from the orthocenter as it is from the circumcenter. For a shape of uniform density, this point is equivalent to the barycenter or the center of mass. Name this intersection of the three medians of a triangle.

centroid (prompt on "center of
mass", "center of gravity", or
"barycenter")



# Round # 2 Extra Section Toss-up Questions

#### Extra Question #1: Literature – British Literature

10 points

This man was described as an artist's "ideal of youth," and that artist dissuaded an elderly caller from pursuing this man. As a sign of reform, he chose to spare Hetty Merton. A sailor pursuing this man known as "Prince Charming" was warned at an opium den about his appearance; that sailor was James Vane, the brother of Sibyl [SIH-bul]. Name this owner of a magical painting that aged in lieu of its owner, created by Oscar Wilde.

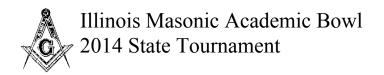
**<u>Dorian Gray</u>** (accept either, prompt on "Prince Charming")

#### Extra Question #2: Fine Arts – Art History

10 points

O	ne of this painter's works showing a shepherd on its right	Titian (o
sic	de and Saint Catherine on its left is known as <i>The</i>	
M	adonna of the Rabbit. He was the favorite portrait artist of	
Eı	mperor Charles the Fifth. This artist is buried in the	
ba	silica of Santa Maria Gloriosa dei Frari, where he painted	
th	e altarpiece. The background of one of his works shows a	
kr	neeling girl with her back towards the viewer going	
th	rough a chest. Name this painter from Venice who in 1538	
co	empleted a work showing a reclining nude, Venus of	
U	rbino.	

#### <u>**Fitian**</u> (or <u>**Tiziano** or <u>**Vecelli**o</u>)</u>



# Round # 2 Extra Section Toss-up Questions

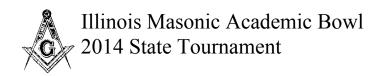
# Extra Question #3: Science – Astronomy

10 points

This constellation is the location of Ross 128. This is the	Virgo
second largest constellation in the night sky after Hydra, and	
it is between Hydra and Bootes [BOO-tus]. It includes the	
binary star Porrima [por-REE-mah], and its brightest star is	
Spica [SPIH-kah]. Markarian's Eyes are part of its galaxy	
cluster, which according to some astronomers includes the	
Local Group and therefore the Milky Way. Name this	
constellation between Leo and Libra that is associated with	
young women.	

## Extra Question #4: Social Studies – U.S. History

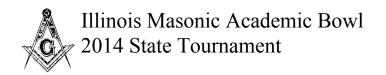
The murders in this state of Nick Ray and Nate Champion	Wyoming
set off the Johnson County War. A city in this state was the	
source of the moniker of Harry Longbaugh, the Sundance	
Kid. This is the home state of former senator Alan Simpson,	
who was replaced by current senator Mike Enzi. Before	
becoming Secretary of Defense, Dick Cheney represented	
this state in the House. Name this western US state with	
capital Cheyenne.	



# Round # 2 Extra Section Toss-up Questions

# Extra Question #5: Mathematics – Math Concepts

Even though he credited somebody else for it, the property	Archimedes of Syracuse
named for this person states that, given any real number,	
there is a larger number. A trammel named for this person is	
used to draw an ellipse, and the equation $r$ equals $a$ plus $b$	
theta generates his namesake spiral. He wrote one book	
estimating the number of grains of sand the universe could	
contain, and he used the method of exhaustion to	
approximate pi. Name this Greek who found a way to	
measure volume using water displacement.	



# Round # 2 Extra Section Teamwork Questions

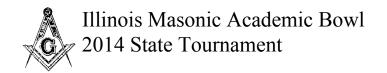
# Extra Question #6: Mathematics – Algebra

10 points per part

	s type of scale is used for the Richter and decibel tems.	
1	Name this type of scale for which regular increases in the input produce smaller changes in the output as both values increase.	semi- <u>log</u> arithmic scale (accept more specific answers such as <u>common log</u> or <u>log base 10</u> )
2	For the Richter scale, multiplying the wave amplitude by ten causes the Richter number to increase by one. If the Richter number increases by four, what is the corresponding number that the wave amplitude is multiplied by?	ten thousand (or 10 <sup>4</sup> )
3	As opposed to amplitude, multiplying the energy by ten raised to the one point five power causes the Richter number to increase by one. If the Richter number increases by four, what is the corresponding number that the energy is multiplied by?	one million (or 10 <sup>6</sup> )

# Extra Question #7: Mathematics – Algebra

	s function has no impact on positive numbers and takes opposite of negative numbers.	
1	Name this function on real numbers whose output is always greater than or equal to zero.	<u>absolute value</u> (or <u>modulus</u> )
2	Absolute value has this quality, referring to functions that have the same value no matter how many times they are applied. That is, the absolute value of the absolute value of a number is the same thing as its absolute value.	
3	Give both solutions to the equation the absolute value of the quantity x-3 equals 5.	



# Round # 2 Extra Section Teamwork Questions

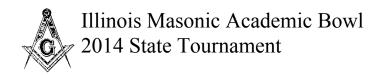
## Extra Question #8: Literature - British Literature

10 points per part

	e speaker in this poem is deaf to the sounds of "five-nines dropped behind."	
1	Name this poem in which the speaker is part of a group	"Dulce et Decorum Est"
1	that is "knock-kneed, coughing like hags."	
	"Dulce et Decorum Est" was written by this English	Wilfred Edward Salter <b>Owen</b>
2	poet who fought in World War I. He also wrote	
	"Anthem for Doomed Youth."	
	The title of "Dulce et Decorum Est" is a barb at this	Horace (accept Quintus Horatius
3	ancient Roman who wrote that "it is sweet and fitting	Flaccus)
	to die for one's country" in one of his odes.	

#### Extra Question #9: Literature - British Literature

	title event is held by Meg Boles in the hope that Stanley bber will play his piano.	
1	Name this play in which Stanley is given a drum, but in the end is taken to Monty for special treatment.	The Birthday Party
2	The Birthday Party was written by this 2005 Nobel Laureate. In another play, this dramatist wrote of two men coming to blows over lighting a kettle.	Harold <u>Pinter</u>
3	In this Harold Pinter play, Gus and Ben argue constantly in a basement room as notes come in through the title object.	The <u>Dumb Waiter</u>



## Round # 3 1<sup>st</sup> Section Toss-up Questions

# **Question #1: Science – Physics**

10 points

The Nyquist value of this quantity is half the sampling value	<u>frequency</u> (or <u>frequencies</u> )
and is used for filters preventing aliasing [AE-lee-uh-seeng].	
These values give the domain when a signal is broken down	
into its components using a Fourier [fur-ee-ay] transform.	
When the driving value of this quantity equals the natural	
value of this quantity for a system, resonance occurs. For a	
moving wave, this quantity equals speed divided by	
wavelength, and this is the reciprocal of period. Name this	
quantity measured in Hertz.	

# **Question #2: Literature – Mythology**

This god is sometimes depicted reclining on a Shesha	<u>Vishnu</u>
[SHAY-shah], a serpent found within an ocean of milk.	
After almost dying in single combat with Jalamdhara	
[jah-lahm-DAH-rah], his consort begged for his life. Two	
hairs plucked from this god's head impregnated Devaki	
[DAY-vah-kee]. This god's mount was born from an egg	
laid by Vinata [vee-NAH-tah]. He took the form of seafoam	
in aiding Indra in the killing of Vritra [VREE-trah]. This	
husband of Lakshmi [LAHK-shmee] will be Kalki in his	
tenth incarnation. Name this "preserver" of the Hindu	
trimurti [tree-MUR-tee], a god with ten avatars.	

#### Round # 3 1<sup>st</sup> Section Toss-up Questions

#### **Question #3: Social Studies – U.S. History**

10 points

One work attributed to Samuel Willard about this incident is presented as a dialogue between S and B. Those accused in this incident included the wife of Governor William Phips. A special court featuring Sam Sewall, John Hathorne, and William Stoughton heard cases stemming from it, and it came to an end following "spectre evidence" being thrown out. It ultimately was traced to the West Indian slave Tituba [tih-TOO-bah] and her tales of voodoo. Name this series of cases which saw 19 women hanged for witchcraft.

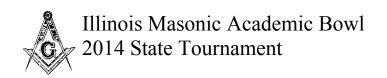
<u>Salem</u> witch trials (prompt on partial answer)

#### Question #4: Literature – World Literature

10 points

This author wrote of a man who had fleeting thoughts of a new science called "phonoscopy." That character, a philologist named Rubin, called Stalin "the Robespierre and the Napoleon of our Revolution wrapped up into one." One work by this author describes what happens to a soldier who returns to the Soviet Union after being captured by the Germans. Another work gives the history from 1918 to 1956 of forced labor camps in the Soviet Union. Name this author of *The First Circle*, *The Gulag Archipelago* [GOO-lahg ahrkeh-PEH-lah-goe], and *One Day in the Life of Ivan Denisovich* [deh-NEE-soe-vich].

#### Aleksandr Solzhenitsyn



#### Round # 3 1<sup>st</sup> Section Toss-up Questions

#### **Question #5: Science - Health**

10 points

This type of disorder, along with a rash and fever, can be caused by Still's disease. This often develops in people who have the skin disease psoriasis [suh-RIE-uh-sis]. One type of this problem is caused by an autoimmune response against the synovial [sih-NOE-vee-ul] membrane, which is the rheumatoid [ROO-mah-toid] type. The most common type of this disorder is caused by the stiffening of cartilage over time, leading to pain in tendons. Name this joint pain that becomes more common with age.

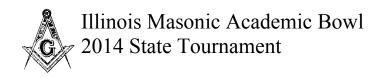
osteo<u>arthritis</u> (accept <u>arthralgia</u>, before joint is mentioned accept joint pain, joint disorder, or joint disease)

#### **Question #6: Fine Arts – Composers of the Modern Era**

10 points

The third movement of this composer's first symphony is a type of French music called a gavotte [gah-VOT]. One of his ballets is *The Prodigal Son*, and another includes "Dance of the Knights." In one of this composer's operas, Truffaldino [troof-fahl-DEE-noe] knocks over Fata Morgana [FAH-tah mor-GAH-nah], causing the Prince to laugh. That prince, the son of the King of Clubs, becomes obsessed with some fruit. Another work by this composer features an argument between a bird and a duck. In that work, the bird has a theme performed on flute, and the duck has a theme performed on oboe. Name this composer of *The Love for Three Oranges* and *Peter and the Wolf*.

#### Sergei **Prokofiev**



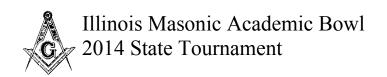
# **Question #7: Science – Biology**

10 points per part

One	e example of this process is diffusion.	
1	Name this movement across a membrane that does not use chemical energy and is often contrasted with active transport.	passive transport
2	This name is given to the passive transport of solvents such as water towards solutes.	<u>osmosis</u>
3	This process separates molecules based on their differing rates of diffusion across a semipermeable membrane. A well-known version of this process removes urea [yoo-REE-uh] from blood.	peritoneal <u>dialysis</u> (or <u>hemodialysis</u> )

## **Question #8: Science – Biology**

DN	A uses thymine instead of this base.	
1	Name this base which is paired with adenine in DNA.	<u>uracil</u>
2	In any order, list the four chemical elements that are in a molecule of uracil.	carbon, hydrogen, nitrogen, oxygen (any order, must give all four without prompting)
3	Cytosine, thymine, and uracil are classified as these types of bases. The other two are purines.	<u>pyrimidine</u> s (do not accept "pyridine"s)



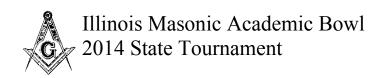
#### Question #9: Literature - U.S. Literature

10 points per part

	er he gave his two children air rifles for Christmas, he d them to shoot all the bluejays they wanted.	
	Name this character who lived up to his old nickname	Atticus Finch (prompt on "Finch")
1	when the local sheriff asked him to shoot a dog that had	
	gone mad.	
	This child of Atticus tore a pair of pants trying to run	<u>Jeremy</u> Finch (accept <u>Jem</u> )
2	away from the Radley home, only to later find them	
	mended and folded over the fence.	
	Jem and Atticus Finch feature prominently in this	Nelle Harper <u>Lee</u>
3	author's novel To Kill a Mockingbird.	

#### **Question #10: Literature – U.S. Literature**

		1
Thi	s real estate broker handles his business with "zip and	
ZOV	vie."	
1	Name this character who became a different person after Paul Riesling was imprisoned for shooting Zilla, but returned to his former self after his wife Myra fell ill.	George F. <u>Babbitt</u>
2	This author of <i>Babbitt</i> wrote about a football captain turned minister in <i>Elmer Gantry</i> .	Harry Sinclair <u>Lewis</u>
3	When George's son Ted chose to marry the girl next door and become a mechanic, George told him to not be scared of the people of this locale.	Zenith, Winnemac



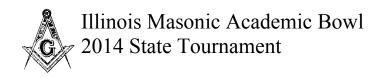
# **Question #11: Social Studies – World History**

10 points per part

	omas Wolsey expanded the utilization of this entity for aches of the peace and encouraged suitors to turn to it.	
1	Name this entity abolished by the Long Parliament, whose punishments were arbitrary but did not include death. Its unpopularity was due in part to it not being bound by common law.	Court of Star Chamber
2	During the reign of this monarch, the Star Chamber was a rallying point against him and Archbishop William Laud. To fund wars against Spain and France, he instituted a forced loan, then arrested those who failed to contribute.	Charles I (prompt on "Charles")
3	The act that abolished the Star Chamber guaranteed this writ, which allows a person to determine whether his arrest is lawful.	Writ of <u>habeas corpus</u> (prompt on that you "have the body")

# **Question #12: Social Studies – World History**

	rough her marriage to Francis the Second, she was queen sort of France.	
1	Name this queen accused by James Douglas of writing the Casket Letters found in the possession of James Hepburn. They were used to implicate her in the murder of her husband Lord Darnley.	Mary Stuart (accept Mary, Queen of Scots)
2	Mary Stuart backed the Ridolfi plot, an attempt to assassinate this English monarch.	Elizabeth I (prompt on "Elizabeth")
3	Sir Francis Walsingham intercepted letters stemming from this other plot to dispatch of Elizabeth I. Once the letters were uncovered, John Ballard was imprisoned, and likely tortured. This plot is named for one of Ballard's co-conspirators.	Babington Plot



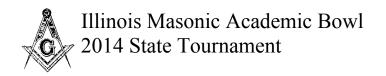
# **Question #13: Fine Arts – Art History**

10 points per part

Naı	me these women who were successful painters.	
1	This woman who moved to New Mexico in 1949 painted many pictures of flowers, animal skulls, and clouds.	Georgia O'Keeffe
2	This American, who moved to Paris in 1866 and often showed her works with the impressionists, painted many pictures of children, sometimes with their mothers.	Mary <u>Cassatt</u>
3	This painter gained fame in 1938 at the age of 78. Most of her works are set outside in small towns, often to commemorate holidays.	Anna Mary Robertson "Grandma"  Moses

### **Question #14: Fine Arts – Art History**

He	painted The Surrender of Breda.	
1	Name this 17 <sup>th</sup> century painter who worked for King Philip the Fourth of Spain.	Diego <u>Velazquez</u>
2	This Velazquez painting shows Philip's daughter Margaret Theresa, a dog, two dwarfs, and a few other people. The background includes Velazquez and the king and queen.	Las <u>Meninas</u> (or The <u>Maids of</u> <u>Honor</u> )
3	Velazquez also painted a work showing Venus and Cupid that is sometimes named for this location in Yorkshire where it was on display for almost one hundred years.	Rokeby



#### Round # 3 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Social Studies – U.S. History**

10 points

This organization's Special Counsel was victorious in *McLaurin v Oklahoma State Regents*, which affected graduate and professional schools. The current publisher of *The Crisis*, retaliatory actions against this group included the murders of field secretaries Harry Moore and Medgar Evers. This group is now headed by Benjamin Jealous, and one of its founders was W.E.B. DuBois. Name this association that bestows Image Awards and Springarn Medals and which lobbies for the constitutional rights of African Americans.

NAACP (accept National
Association for the Advancement
of Colored People)

#### **Question #16: Science – Chemistry**

10 points

Zinc only has this quality between 100 and 150 degrees Celsius, which is one of several examples of materials that can transition between having this property and being brittle. The element lead has this property, which describes how materials react to compressive stress. These materials can be hammered or put through rollers without breaking, especially elements such as gold and aluminum that can be made into foils. Name this property of metals that is similar to ductility.

#### malleability (or malleable)

### Round # 3 3<sup>rd</sup> Section Toss-up Questions

#### **Question #17: Language Arts – Grammar/Usage**

10 points

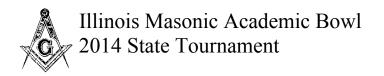
In Art of Grammar, this part of speech was put in the same	<u>noun</u> s
classification as an adjective, as it inflects for case. If used	
in reference to possession, these are classified as	
inalienable. Depending on the accompanying words, these	
are divided into count and mass subclasses. These are	
always capitalized in German. The verbal types of these are	
gerunds, and these are classified as concrete if they can be	
sensed directly. Name these parts of speech classified into	
persons, places, things, and ideas.	

#### **Question #18: Social Studies – Religion**

10 points

This doctrine was allegedly proven true when its subject appeared with a certain title to St. Bernadette at Lourdes. This concept was "a singular grace and privilege of almighty God and by virtue of the merits of Jesus Christ." Its feast day was originally held in honor of St. Anne. Initially promulgated in *Ineffabilis Deus* [in-ehf-fah-BEE-lis DAY-oos] by Pius the Ninth, it did not exempt its subject from the temporal penalties of Adam. Name this Christian belief that original sin did not apply to the Virgin Mary.

immaculate conception (accept
divine maternity)



## Round # 3 3<sup>rd</sup> Section Toss-up Questions

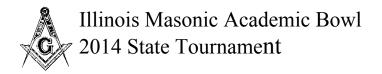
# **Question #19: Mathematics – Math Concepts**

10 points

This is the least restrictive quadrilateral in which the product	<u>trapezoid</u> (prompt on "trapezium")
of the areas of the triangles formed by one diagonal equals	
the product of the areas of the triangles formed by the other	
diagonal. This shape is used to derive a formula in which	
the first and last y-coordinates from a set of points are	
multiplied by one, while the others are multiplied by two,	
used to approximate an integral. Name this quadrilateral in	
which two pairs of adjacent angles are supplementary and in	
which one pair of opposite sides is parallel.	

#### **Question #20: Miscellaneous – Journalism**

	1
In 2003, Bob Dole and Bill Clinton were featured in a short	60 Minutes
revival of this show's "Point/Counterpoint" segment.	
Executive Producer Don Hewitt drew criticism for his	
handling of a story involving Big Tobacco. Until his death,	
Andy Rooney provided commentary to close this show. In	
2013, this show apologized for a report on the 2012	
Benghazi attack. Always starting with its trademark ticking	
Aristo stopwatch, name this long-running CBS program that	
airs every Sunday at 6 PM Central Time.	



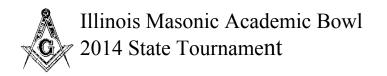
# **Question #21: Mathematics – Algebra**

10 points per part

	elid [YOO-klid] proved that there are an infinitely many hese numbers.	
1	Name these whole numbers only evenly divisible by one and themselves.	<pre>primes (or prime numbers)</pre>
2	This is the name of pairs of prime numbers that differ by two.	<u>twin</u> primes (or <u>twin</u> s)
3	This is the only prime number that is in two pairs of twin primes.	<u>5</u>

# **Question #22: Mathematics – Algebra**

	e period of a pendulum varies with this function applied ts length.	
1	Name this function equivalent to raising a number to the one-half power.	square <u>root</u> (accept <u>radical</u> )
2	Simplify the square root of 18.	3 root 2 (or 3 times the square root of 2 or 3 radical 2 or equivalents)
3	Find the square root of the quantity 16 raised to the fourth power. Give your answer without using any exponents or roots.	<u>256</u>



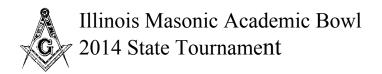
# Question #23: Social Studies - U.S. Government

10 points per part

	e corruption of one's blood on account of this is bidden, outside of the person committing the act.	
1	Name this act of levying war against the United States, or giving aid and comfort to the enemy.	treason
2	The definition of treason, and Congress' authority to decide the punishment for it, is outlined in Section 3 of <i>this</i> article of the US Consitution.	Article Three (or 3 <sup>rd</sup> )
3	If the accused does not confess in open court, then at least this many witnesses must testify to the overt act for a treason conviction.	<u>two</u>

#### Question #24: Social Studies - U.S. Government

The	immediate predecessor to this amendment was struck	
dov	on by the Supreme Court in <i>Pollock v Farmers' Loan</i>	
ana	Trust.	
	Name this amendment, which gave Congress the power	<b>Sixteenth</b> Amendment (or <u>16</u> )
1	to lay and collect taxes on income.	
	The tax that was ruled unconstitutional in <i>Pollock</i> was a	Wilson-Gorman Tariff (accept
2	2% tax on income above \$4,000. That tax was passed	Revenue Act of 1894)
	by Congress as part of this 1894 Tariff.	
	In <i>United States v Sullivan</i> , the Supreme Court ruled	<u>Fifth</u> Amendment (or <u>5</u> )
3	that the right in this amendment against being a	
3	witness against oneself could not be used by	
	bootleggers as a shield against paying taxes.	



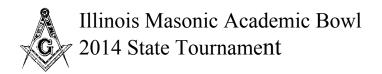
# **Question #25: Science – Physics**

10 points per part

Th	s law is often expressed with the equation F equals k	
tim	es x. A negative sign is sometimes used to show that	
the	force and displacement are in opposite directions.	
	Name this law, often applied to springs, named for a	<b>Hooke</b> 's law
1	British scientist.	
	This three-word phrase is used to describe the	simple harmonic motion (prompt
2	movement of objects that are influenced only by	on "SHM")
	Hooke's law.	
	To apply Hooke's law to three dimensions, these	<u>tensor</u> s
3	mathematical constructions are used that relate vectors	
	to each other and look like matrices [MAY-trih-sees].	

# **Question #26: Science – Physics**

The	ese particles include leptons.	
1	Name these particles, contrasted with bosons [BOE-sons], that have half-integer spins.	<u>fermion</u> s
2	Fermions follow this principle often applied to electron orbitals stating that two identical fermions cannot be in the same quantum state at the same time.	Pauli exclusion principle
3	The fact that particles have intrinsic spin that is quantized was demonstrated in this 1922 experiment.	Stern-Gerlach experiment



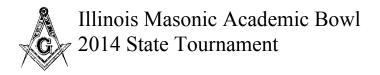
# **Question #27: Literature – Mythology**

10 points per part

Thi lett	s goddess conceived Hebe [HEE-bee] with the help of ace.	
1	Name this queen of Olympus and wife of Zeus.	Hera (accept Juno)
2	As was tradition, Hera became furious upon learning that Hebe was to be supplanted as Olympus' cupbearer by this most beautiful of mortals. This man's father was given two horses by Zeus in exchange for kidnapping the lad.	Ganymede
3	Annually, Hera bathed in the well of Canathus to restore this quality. Hestia swore by the head of Zeus to maintain this quality for eternity.	virginity (accept equivalents)

## **Question #28: Literature – Mythology**

108	innounce the coming of Ragnarok [RAG-nah-rok], this	
god	will blow the Gjallarhorn [GYAL-lahr-horn] such that	
the	whole world will hear it.	
	Name this mythical watchman of Asgard. This god has	Heimdall (prompt on "Rig")
1	much in common with Agni from the Rigveda	
	[rig-vay-dah].	
	Heimdall is the guardian of this "rainbow bridge," the	Bifrost (accept Asbru)
2	only entrance to Asgard.	
	Heimdall had this many mothers. In Greek mythology,	2
3	this is how many muses there are.	
	·	



#### Round # 3 5<sup>th</sup> Section Toss-up Questions

#### **Question #29: Science – Biology**

10 points

The rate of this process is graphed on the y-axis of a P.I. curve, and one of the first scientists to demonstrate this was Jan Ingenhousz [EEN-gen-house]. Near the end of this process, the iron-containing protein ferredoxin [fehr-uh-DAHK-sin] is used for phosphorylation [fahs-for-uh-LAY-shun], and an earlier part of this process uses pheophytin [fee-ah-FIE-tin] for electron transfer. This process often creates sucrose and oxygen, using up water and carbon dioxide. Name this process that uses light in green plants.

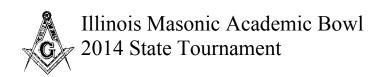
photosynthesis (prompt on "light"dependent "reaction"s or
"photophosphorylation")

## **Question #30: Mathematics – Math Concepts**

10 points

This theorem could be proved in a new way if Grunbaum's conjecture was proven. Attempts to prove this theorem led to the development of Kempe chains and to snarks, the latter of which is a type of graph. Heinrich Heesch's work on reducibility and discharging was used in the proof by Wolfgang Haken [HAH-ken] and Kenneth Appel, which used a computer to consider 1,936 cases. Name this theorem which, assuming that regions are contiguous, provides a limit to the number of hues needed to fill in a map.

**four-color** map theorem



#### Round # 3 5<sup>th</sup> Section Toss-up Questions

#### Question #31: Literature - U.S. Literature

10 points

A letter this character was meant to carry to Fort Edward was used by Montcalm in negotiations with Munro. He was taken prisoner during the rescue of Wah-ta-Wah. Before Abiram confessed, Ishmael Bush believed this man to be the killer of Asa. He correctly established that Oliver Edwards was shot by Judge Temple. Name this frontiersman sometimes referred to as Hawkeye who is a close friend of Chingachgook [CHING-gach-gook] in James Fenimore Cooper's Leatherstocking Tales.

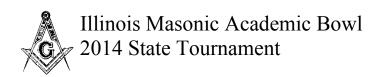
Natty Bumppo (accept either, accept Trapper, Pathfinder, the Last of the Mohicans, or Deerslayer, accept Hawkeye or Leatherstocking until they are mentioned)

#### **Question #32: Social Studies – World History**

10 points

This person wrote of aspirations to lead "55 million Arabs, then 224 million Africans, then 420 million followers of Islam" in *Philosophy of the Revolution*. Though it was nominally headed by Muhammad Naguib [nah-GEEB], this person controlled the Revolutionary Command Council. He blocked access to the Straits of Tiran [tih-RAHN] in response to the withdrawal of funding for the Aswan High Dam. Convinced not to resign following the Six-Day War, he oversaw the exile of King Farouk [fah-ROOK] the First. Anwar Sadat [sah-DAHT] replaced this man after his death. Name this first president of Egypt.

Gamal Abdel <u>Nasser</u> (accept Jamal Abd al-Nasir)



# Round # 3 Extra Section Toss-up Questions

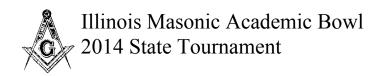
# **Extra Question #1: Science – Chemistry**

10 points

As with the element below it on the periodic table, this	<u>Titanium</u>
element is isolated when its tetrachloride	
[teh-trah-KLOR-ide] is combined with liquid magnesium or	
sodium in the Kroll process. The dioxide [die-OK-side] of	
this element, a white pigment, is found in the minerals	
anatase [A-nah-tase], brookite, and rutile [ROO-til]. This	
element often is combined with aluminum and other metals	
to create lightweight temperature-resistant alloys for	
expensive engines and sports equipment. Name this	
transition metal following scandium on the periodic table.	

# Extra Question #2: Fine Arts – Classical/Opera

It is believed that this composer used the premier of his	George Frideric <u>Handel</u>
<i>Israel in Egypt</i> to also premier his 13 <sup>th</sup> organ concerto,	
which, due to some high-pitched sections that sound like	
bird calls, is now nicknamed "The Cuckoo and the	
Nightingale." Another work by this composer is now	
nicknamed "The Harmonious Blacksmith." English	
coronation ceremonies use this composer's Zadok the	
<i>Priest</i> . Name this composer who repeats the words "forever	
and ever" near the end of his <i>Messiah</i> oratorio in the	
Hallelujah chorus.	
and ever" near the end of his <i>Messiah</i> oratorio in the <i>Hallelujah</i> chorus.	



# Round # 3 Extra Section Toss-up Questions

#### Extra Question #3: Literature – British Literature

10 points

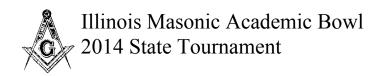
This character was almost fired after calling his boss	<u>Jeeves</u>
"subject to hallucinations and generally potty" in front of	
Mortimer. Along with Bates, this man was the victor in the	
Great Sermon Handicap. Among the plans executed by this	
man are ruining the engagement of Honoria Glossop, as	
well as removing Claude and Eustace from the immediate	
family. Employed by Bertie Wooster, name this man created	
by P. G. Wodehouse, the consummate butler.	

#### **Extra Question #4: Mathematics – Math Concepts**

10 points

This number gives the ratio of the side lengths of Penrose tile kites and darts. The Fibonacci [fih-boe-NAH-chee] sequence can be expressed using powers of this number and its reciprocal, and the limiting ratio of successive terms of the Fibonacci sequence equals this number. Removing a square sharing a side with a rectangle whose side lengths are in this ratio leaves another rectangle whose side lengths are in this ratio. Name this solution of  $x^2$ -x-1=0, an irrational number that approximately equals 1.618.

golden ratio (or golden mean or golden section or golden cut or mean of Phidias, accept divine in place of golden, prompt on "phi")



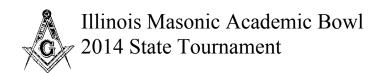
# Round # 3 Extra Section Toss-up Questions

#### Extra Question #5: Social Studies – World History

10 points

Extended to maritime conflict through the efforts of Mikhail Muravyov [myoo-RAH-voev] and Tsar [tsahr] Nicholas the Second, one protocol added later to this agreement extended its guidelines to those involved in "self-determination." Its initial negotiations were instigated by Henri Dunant [doo-nahn], the founder of the Red Cross. The US is not party to its second protocol, which prohibits the taking of hostages and torture. Name this set of international protocols regarding civilians and military conflict.

Geneva Conventions (prompt on "Geneva Protocol"s, do not accept "Geneva Accords", which are tied to the liberation of Vietnam)



# Round # 3 Extra Section Teamwork Questions

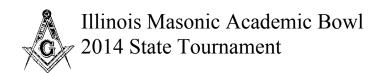
## Extra Question #6: Science - Chemistry

10 points per part

	s person and Antoine Bussy were the first people to ate beryllium [beh-RIL-ee-um].	
1	Name this scientist whose namesake synthesis converts ammonium cyanate into urea [yoo-REE-uh].	Friedrich Wöhler
2	Wöhler was the first person to isolate this element found in bauxite [BAWK-site].	Aluminum
3	Wöhler's synthesis of urea was a strike against this belief that living organisms are governed by different	<u>vitalism</u> (accept different word forms)

# Extra Question #7: Science - Chemistry

	s person predicted the existence of several elements, on using the prefix eka	
1	Name this Russian credited for developing a Periodic Table of the Elements.	Dmitri <u>Mendeleyev</u>
2	One of Mendeleyev's predictions was for ekamanganese, which turned out to be this element without any stable isotopes that became the first element produced artificially before it was found in nature.	technetium
3	Technetium [tek-NEE-shum] was created with the help of this person who invented the cyclotron. A different element is named for this person.	Ernest Orlando <u>Lawrence</u>



# Round # 3 Extra Section Teamwork Questions

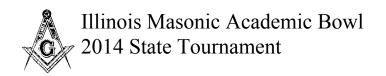
# Extra Question #8: Literature – World Literature

10 points per part

	his novel, a dragon turned into a horse after devouring horse belonging to Tripitaka [trih-PIT-uh-kuh].	
1	Name this novel in which the protagonist defeated three Taoist magicians in a contest of miracles involving	Journey to the West (accept <u>Hsi-yu chi</u> , <u>Xiyou ji</u> , or <u>Monkey</u> , but
	decapitation and boiling oil.	do not mention the last title)
	Journey to the West features the character of Tai Tsung	People's Republic of <b>China</b>
2	[tie soong], an emperor of this nation's Tang [tahng]	
	dynasty.	
	The protagonist of <i>Journey to the West</i> is Sun Wukong,	Monkey King
3	one of these animals. After learning the 72	
3	transformations and the cloud trapeze, he is able to leap	
	great distances.	

#### Extra Question #9: Literature – World Literature

Its	sections concerning comedy have been lost forever.	
1	Name this treatise that described mimesis [mee-MEE-sis] as a creative process that could build upon human nature. It also described six elements of tragedy, including spectacle, rhythm, and song.	Poetics (accept De Poetica)
2	<i>Poetics</i> was written by this Greek philosopher and tutor to Alexander the Great.	<u>Aristotle</u>
3	Aristotle coined this term to describe the actions of a protagonist having the opposite of the intended effect.	<u>peripeteia</u>



#### Round # 4 1<sup>st</sup> Section Toss-up Questions

#### **Question #1: Science – Astronomy**

10 points

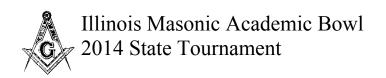
The emission type of these objects absorbs ultraviolet light	<u>nebula</u> e (or <u>nebula</u> s)
and emits visible light, and that type often is known as an H	
two region because it contains large amounts of atomic	
hydrogen. Those H two regions are also classifed as the	
diffuse types of these, as are supernova remnants. Some	
famous examples of these are the Trifid, Eagle, and Lagoon,	
and the type of these objects formed in the creation of a	
white dwarf is the planetary type. Name these objects,	
including the Crab, that are interstellar clouds.	

#### Question #2: Social Studies – U.S. Government

10 points

John Nance Garner took this post a year before being elected as Vice President. While holding this post, Thomas Reed introduced rules that established the principle of party responsibility. President Ronald Reagan said he was friends after 6 PM with the holder of this office, Tip O'Neill. The first holder of this office was Frederick Muhlenberg. After the Vice President, the holder of this post is next in the line of presidential succession. Name this post currently held by John Boehner [BAY-ner].

**Speaker** of the United States House of Representatives



### Round # 4 1<sup>st</sup> Section Toss-up Questions

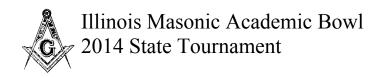
## **Question #3: Literature – U.S. Literature**

10 points

The narrator of this work speaks of a "dove that listens,	"The <u>Bells</u> "
while she gloats on the moon!" That narrator "shivers with	
affright at the melancholy menace" of the subject of this	
poem. The narrator of this poem describes "a world of	
merriment" foretold by the title objects. "Keeping time,	
time, time in a sort of Runic rhyme," those objects are	
silver, golden, brazen, and iron. Name this poem by Edgar	
Allan Poe which describes the tintinnabulation of the title	
noisemakers.	

# **Question #4: Miscellaneous – Agriculture**

During fallow periods in this process, hairy vetch and	crop rotation (accept equivalents
clovers serve as covers. During this, brassicas	such as rotating crops)
[BRAS-ih-kahs] are popular for nutrient scavenging and	
pest control. Ergot [UR-got] is recommended in this process	
as a weed-killer, while legumes [LEG-ooms] are	
recommended for their ability to fix nitrogen. This process	
generally produces row crops, close-growing grains, and	
sod-forming crops from the same ground. Name this	
practice of planting a succession of different crops on the	
same land.	



### Round # 4 1<sup>st</sup> Section Toss-up Questions

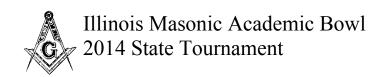
# **Question #5: Science – Chemistry**

10 points

The transportation of ions of this element is hindered by	<u>Potassium</u>
both apamin [AP-uh-min] and dendrotoxin, which explains	
why bee stings and snake bites can be painful and	
dangerous. Its nitrate is known as niter [NIE-ter] in	
mineral form and is a major component in gunpowder and	
fertilizers. A common way to date rocks is based on the	
decay of this element into argon. Name this alkali metal	
very similar to sodium whose chemical symbol comes	
from its neo-Latin name of kalium.	

## **Question #6: Social Studies – World History**

	- <b>/</b>
His rule saw the conquest of Badakhshan	Shah <u>Jahan</u> (accept Prince
[bah-DAHK-shahn] and Ahmadnagar	Khurram)
[ah-MAHD-nah-gahr], and moved the imperial capital to	
Delhi. This ruler commissioned a fortification containing	
the Halls of Public and Private Audience; that structure is	
the Red Fort. He also ordered the construction of several	
Pearl Mosques. With the support of Asaf Khan, this ruler	
proclaimed himself emperor following the death of his	
father Jahangir [jah-HAHN-ger]. This Mughal [MOO-gahl]	
ruler was the father of Aurangzeb [AWR-ung-zeb]. Name	
this leader who honored his wife who died in 1631 by	
ordering the construction in Agra of the Taj Mahal.	



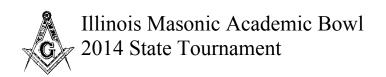
# **Question #7: Mathematics – Geometry**

10 points per part

	circle has this relationship to a regular polygon, then circle is tangent to all of the polygon's sides.	
	Name this relationship. If a regular polygon has this	inscribed (accept word forms such
1	relationship to a circle, then the vertices [VER-tuh-sees]	as inscription)
	of the polygon are on the circle.	
	If a circle has a radius of length 1, this is the area of its	<u>2</u>
2	inscribed square. Do not worry about units.	
	If a square has a side length of 2, this is the area of its	1 <u>pi</u>
3	inscribed circle. Do not worry about units.	

# **Question #8: Mathematics – Geometry**

		, To pointe por part
	rre Wantzel proved that certain problems were olvable using only this instrument and a straightedge.	
1	Name this instrument used for drawing arcs of circles.	compass
2	One of the problems Wantzel showed to be unsolvable was doing this to an angle.	trisecting (accept other word forms or answers equivalent to dividing into three congruent parts, do not accept "bisect"ing)
3	If you trisected a right angle and used one of those angles in a right triangle, this would be the ratio of the longer leg of the triangle to the shorter leg.	square root of 3 (or root 3 or radical 3)



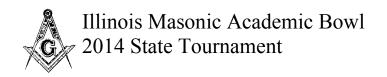
# **Question #9: Literature – Mythology**

10 points per part

	e epithet of this goddess is <i>potnia theron</i> , meaning stress of the animals."	
1	Name this goddess, the daughter of Leto [LEE-toe] and twin of Apollo.	Artemis (accept Diana)
2	When Apollo killed this queen's sons, Artemis killed her daughters. This daughter of Tantalus who became a Theban [THEE-bun] queen insulted Leto for only having two children before losing fourteen.	Niobe
3	This hunter made the fatal mistake of seeing Artemis bathe nude. The goddess turned him into a stag, and his own dogs hunted him down.	Actaeon

# **Question #10: Literature – Mythology**

	The Destruction of Mankind," this goddess turned into hmet [SEK-met] in order to punish mankind.	
1	Name this goddess usually depicted with the sundisk. Her name can be translated as "The House of Horus."	<u>Hathor</u>
2	Hathor was "The House of Horus" in her role as the embodiment of the sky in the form of this animal. In Greek mythology, Io [IE-oh] was changed into one of these animals.	Celestial <u>Cow</u> (accept <u>heifer</u> or <u>cattle</u> )
3	Priestesses of Hathor often wore the menit [MEH-nit], one of these objects with a crescent in front and a counterweight in the back.	necklace (prompt on "amulet" or "jewelry")



# **Question #11: Science – Biology**

10 points per part

Sor	ne of these cells are classified as helpers.	
1	Name these small lymphocytes [LIM-foe-sites] that work with B cells in the immune system.	<u>T</u> cells (or <u>T lymphocyte</u> s)
2	T cells get their name from the fact that they develop in this organ.	<u>thymus</u>
	Antibodies produced by B cells are also given this	immunoglobulins

# **Question #12: Science – Biology**

Thi	s fluid is similar to blood plasma.	
1	Name this fluid that brings bacteria to its namesake nodes.	lymph
2	An example of lymphoid tissue is this pair of objects in the pharynx [FA-reenks] at the back of the throat. If these become swollen, they can be removed.	<u>tonsil</u> s
3	Lymph enters the bloodstream through this vein that is fed by the axillary vein and that joins with the internal jugular vein.	<u>subclavian</u> vein

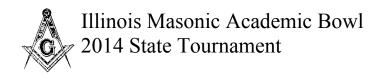
## **Question #13: Fine Arts – Musical Theater**

10 points per part

Ide	ntify these Andrew Lloyd Webber musicals.	
1	Based on a Gaston Leroux [leh-ROE] novel, this musical with the song "The Music of the Night" is about a disfigured man who lives under a stage.	The <u>Phantom of the Opera</u>
2	Based on the New Testament, this musical with the song "I Don't Know How to Love Him" ends with a crucifixion.	Jesus Christ Superstar
3	Built up from Webber's earlier musical <i>Cricket</i> , this musical begins with the song "Love Changes Everything", which is sung by Alex Dillingham, a fan of actress Rose Vibert.	Aspects of Love

#### **Question #14: Fine Arts – Musical Theater**

	s musical is set in the Kit Kat Klub in Berlin at the inning of the Nazi Era.	
1	Name this Kander and Ebb musical that asks, "What good is sitting alone in your room?"	<u>Cabaret</u>
2	This daughter of Judy Garland won an Oscar for her performance in the movie version of <i>Cabaret</i> .	Liza <u>Minnelli</u>
3	This musical also deals with running from the Nazis. It is about the Trapp Family Singers and includes the songs "My Favorite Things" and "Do-Re-Mi".	The Sound of Music



#### Round # 4 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Literature – British Literature**

10 points

In this novel, an Officer of the Guards caught his cheating	Vanity 1
wife with the Lord of the Powder Closet. The chief	Hero
exponent of the title concept was a charity pupil at Miss	
Pinkerton's School. John Osborne cut off his son's	
inheritance over his choice of wife, but that son dies at the	
Battle of Waterloo. Focusing on the contrasting Amelia	
Sedley and Becky Sharp, name this "Novel Without a Hero"	
written by William Makepeace Thackeray.	
·	

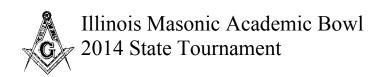
<u>Vanity Fair</u>: A Novel Without a

#### **Question #16: Science – Physics**

10 points

The waves named for this person, which are very similar to Lamb waves, travel along solid surfaces and are generated by earthquakes. His name also is used for the situation when the minimum amplitude of one diffraction image coincides with the maximum amplitude of another, his namesake criterion. This person is also named for the elastic scattering of light, which is used to explain why the sky is blue. Name this scientist whose namesake scattering is often contrasted with Raman [RAH-mun] scattering.

3<sup>rd</sup> Baron Lord <u>**Rayleigh**</u> (or John William <u>**Strutt**</u>)



#### Round # 4 3<sup>rd</sup> Section Toss-up Questions

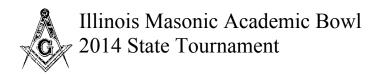
#### **Question #17: Fine Arts – Art History**

10 points

A revival of this period of artwork was led by John Henry
Belter. Early examples of this style can be found in the
Basilica of the Fourteen Holy Helpers, the Pilgrimage
Church of Wies [vees], and Ottobeuren [ah-toe-BOY-ren]
Abbey, all of which are in Bavaria. Paintings from this
period include Diana Leaving the Bath and The Toilet of
Venus by Francois Boucher [fran-swah boo-shay].
Decorative colors such as gold were used during this period.
Name this era featuring Antoine Watteau [wah-too] and
Jean-Honore Fragonard [zhahn on-oh-ray frah-goe-nahr]
that started in Paris in the 18<sup>th</sup> century as a reaction to
Baroque.

#### Question #18: Social Studies - U.S. History

John Randolph refused to fire at this person during a duel	Henry <u>Clay</u>
that both men survived. He successfully defended Aaron	
Burr on charges of treason. This politician was passed over	
as a presidential candidate twice, by William Henry	
Harrison and Zachary Taylor, who were elected as Whigs.	
He was offered the Secretary of State post as part of the	
"Corrupt Bargain" which led to the election of John Quincy	
Adams. Name this Kentucky Congressman known as the	
"Great Compromiser."	



# Round # 4 3<sup>rd</sup> Section Toss-up Questions

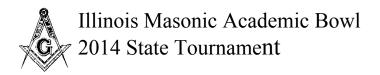
# **Question #19: Mathematics – Math Concepts**

10 points

These numbers can be generated by adding successive	perfect numbers
powers of two until the sum is prime and then multiplying	
that prime times the last number added. That method is the	
only successful one ever used to find these numbers. That	
method, stated by Euclid [YOO-klid], gives the relationship	
between these numbers and Mersenne [mer-sen] numbers.	
These whole numbers, which are not superabundant or	
deficient, have no known odd examples. Name these	
numbers that equal the sum of their proper divisors.	

#### **Question #20: Literature – World Literature**

In one work, this author defined suicide as "the confession	Albert <u>Camus</u>
that life is not worth living," and cited the "leap of faith" as	
a philosophical suicide. He wrote of a man who went to the	
Home for Aged Persons in Marengo [mah-RAIN-goe]	
following his mother's death; the Home's warden later	
testified at that man's trial. This author of <i>The Myth of</i>	
Sisyphus [SIH-suh-fus] also wrote a novel set in Oran that	
describes the exploits of Dr. Bernard Rieux [roo]. Name this	
author of <i>The Plague</i> who wrote about Meursault	
[mehr-sole] in The Stranger.	



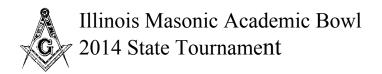
# **Question #21: Science – Chemistry**

10 points per part

thro	ht with shorter wavelengths is scattered when going bugh these solutions, which is known as the Tyndall	
effe	ect.	
1	Name these suspensions of a molecule of one substance throughout another substance.	<pre>colloids (or colloidal solutions or colloidal suspensions)</pre>
2	This type of colloid consists of a liquid dispersed throughout another liquid.	<u>emulsion</u>
3	This is the movement of dispersed particles caused by an electric field.	<u>electrophoresis</u>

# **Question #22: Science – Chemistry**

		re penne per part
	s theory developed by Linus Pauling describes the etron orbitals in many molecules.	
1	Name this mixing of orbitals to form new orbitals.	orbital <u>hybrid</u> ization
2	In methane, one <i>s</i> orbital joins with this number of <i>p</i> orbitals to form a hybrid orbital.	3
3	This molecular shape occurs in molecules with sp <sup>3</sup> d [s p 3 d] hybridization.	trigonal bipyramidal (prompt on "bipyramid"al, do not accept "trigonal")



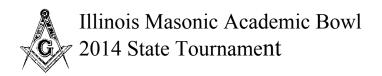
#### **Question #23: Literature – British Literature**

10 points per part

	demoted his chief of staff for getting into a drunken	
bra	wl with Roderigo [ro-deh-REE-goe].	
1	Name this commander who refused to fight his father-in-law Brabantio [brah-BAHN-choe] on account of pending action concerning Cyprus.	Othello (prompt on "the Moor of Venice")
2	Due to accusations of infidelity, this wife of Othello was smothered in her bedchamber.	<u>Desdemona</u>
3	This item, Othello's first gift to Desdemona, was used by Iago [ee-AH-goe] to further the false accusations against Cassio and Desdemona.	<u>handkerchief</u>

#### **Question #24: Literature – British Literature**

	wrote about his experiences fighting in the Spanish il War in <i>Homage to Catalonia</i> .	
1	Name this author who wrote of a dystopian [dis-TOE-pee-un] future ruled by Big Brother in 1984.	George Orwell (accept Eric Arthur Blair)
2	In another memoir, Orwell wrote about being a sub- divisional police officer. In that role, he was tasked with eliminating one of these animals that had killed an immigrant worker.	elephant
3	Orwell's <i>Shooting an Elephant</i> was set in the city of Moulmein [mole-main] in this modern-day country.	Burma (accept Myanmar)



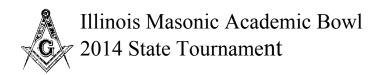
# Question #25: Social Studies – U.S. History

10 points per part

Its (	capture was immediately preceded by a victory at Kettle	
1	Name this hill whose capture by forces under John Miley provided a strategic viewpoint for a later siege on Santiago.	San Juan Hill (accept San Juan Ridge)
2	The capture of San Juan Hill was a key victory for the American forces fighting in this 19th century conflict.	Spanish-American War
3	Following the Spanish-American War, this colony's Moro people fought a war in which Leonard Wood ordered the massacre of 600 people hiding inside a crater on the island of Jolo.	<b>Philippines</b>

# **Question #26: Social Studies – U.S. History**

	motto was "Our country is the world - our countrymen mankind."	
1	Name this newspaper whose founder lambasted gradualists, writing that "I am in earnest, I will not equivocate, I will not excuse, I will not retreat a single inch, and I will be heard."	The <u>Liberator</u>
2	This Quaker publisher of <i>The Liberator</i> ceased publication after the passage of the Thirteenth Amendment.	William Lloyd <u>Garrison</u>
3	Garrison drew even more controversy for defending this founder of the League of Gileadites [GIL-ee-uh-dites], a slave-catcher resistance group. This person was later hanged for raiding an armory in what was then Virginia.	John <u>Brown</u>



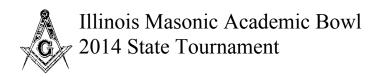
#### **Question #27: Mathematics – Pre-Calculus**

10 points per part

The	type of curvature named for this person is the product	
of t	wo other curvatures, and his name is combined with	
Wil	helm Jordan's to name a type of matrix algorithm.	
	Identify this mathematician and scientist whose name is	Carl Friedrich Gauss
1	sometimes used for the normal distribution.	
	One legend about Gauss is that as a young boy he was	<u>5050</u>
2	able to quickly find the sum of the first 100 positive	
	integers. What is that sum?	
	Find the solution to a system if the augmented matrix	(2,5,1) (order matters)
	representing it can be put in echelon [eh-sheh-lon] form	
3	with top row 1 1 1 8, second row 0 1 1 6, and bottom	
	row 0 0 1 1. Give your answer as an ordered triple	
	without naming variables.	

#### **Question #28: Mathematics – Pre-Calculus**

	ake sure you give the three dimensional name rather than e two dimensional name.	
1	Name the shape of the surface generated by the equation $z=x^2+y^2$ .	paraboloid
2	Find the x- and y-coordinates that give the minimal value of the expression $x^2-4x+y^2+10y+3$ . Remember that you only need to give the x- and y-coordinates.	$(\underline{2},\underline{-5})$ (or $\underline{\mathbf{x=2, y=-5}}$ or equivalents)
3	Name the shape formed by the intersection of the plane $z=5$ and the paraboloid $z=x^2+3y^2$ .	ellipse (do not accept "ellipsoid")



## Round # 4 5<sup>th</sup> Section Toss-up Questions

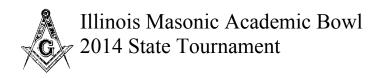
# **Question #29: Science – Biology**

10 points

These organisms can be genetically engineered to test for	<u>veast</u> s
interactions between proteins, which is known as two-	
hybrid screening. These organisms include a relatively small	
number of basidiomycota [bah-SIH-dee-oh-mie-koe-tah]	
and all of the other dikaryas [die-KAR-ee-uhs]. Some of	
these fungi [FUN-jie] create zymase [ZIE-mase], and many	
of them are Ascomycota [as-koe-mie-KOE-tah], including	
the genus Saccharomyces [sa-kah-roe-MIE-sees]. Name	
these organisms, some of which are used in baking to	
convert carbohydrates into carbon dioxide or alcohol.	

# Question #30: Literature - U.S. Literature

One character's love in this novel is revealed when a stolen	<u>Little Women</u>
glove is discovered. One character in this novel is seen	
weeping after selling her chestnut hair for \$25. That	
decision was made to raise money to visit the family	
patriarch, a Civil War chaplain. At the end of this novel,	
Plumfield is turned into a school for boys by Professor	
Bhaer and his wife. One of its sequels was <i>Jo's Boys</i> . Jo's	
sisters were Meg, Beth, and Amy. Name this first novel	
about the March sisters, written by Louisa May Alcott.	



## Round # 4 5<sup>th</sup> Section Toss-up Questions

# **Question #31: Mathematics – Math Concepts**

10 points

This type of math is used with exponents to define the
Carmichael function, and this is also used to succinctly state
the Chinese Remainder Theorem and Fermat's Little
Theorem. Equivalent to a quotient ring, this can be
represented with a $Z$ slash $n$ $Z$ , and this places all integers
into residue or congruence classes. Name this system in
which two numbers are congruent if they give the same
remainder when they are divided by the same number, an
example of which is clock arithmetic.

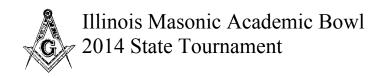
<u>mod</u>ular arithmetic (prompt on "clock" arithmetic)

### **Question #32: Social Studies – World History**

10 points

Immediately prior to this event, its target suspended the			
penal laws against dissenters and recusants through a			
Declaration of Indulgence. During this, the Convention			
Parliament derided the forced disarmament of Protestants			
and the creation of a court for Ecclesiastical			
[eh-KLEE-see-as-tih-kul] Causes, later outlawed via a Bill			
of Rights. This was precipitated by the birth of James			
Francis Edward Stuart, and this ended the reign of the last			
Catholic English monarch. Name this event which saw the			
overthrow of James the Second and the ascension of			
William & Mary to the English throne.			

# Glorious Revolution (or Revolution of 1688)



# Round # 4 Extra Section Toss-up Questions

#### Extra Question #1: Mathematics – Math Concepts

10 points

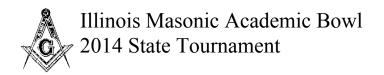
This person and Richard Taylor co-authored the article	Andrew Wiles
"Ring-Theoretic Properties of Certain Hecke [HECK-eh]	
Algebras." Helped by a paper on the Eisenstein ideal by	
Barry Mazur [MAY-zur], this person matched modular	
forms to elliptic curves. That work was noteworthy because	
of a proof of the epsilon conjecture by Ken Ribet [RIH-bet],	
which increased the notoriety of the Taniyama-Shimura	
[tah-nee-yah-mah shee-muh-rah] conjecture. Name this man	
who proved that there are no integer nonzero solutions to	
$a^n+b^n=c^n$ [a to the n plus b to the n equals c to the n] for n	
greater than two, which is Fermat's [fehr-mah's] Last	
Theorem.	

#### Extra Question #2: Literature – World Literature

10 points

This work describes light, fire, and darkness as the three forces of nature. It also outlines three paths, those of wisdom, action, and devotion, as ways to transcend the three *gunas* [GOO-nahs]. This tale begins with a warrior focusing on the fact that he must fight his relatives. It consists of a dialogue between Arjuna [ar-JOO-nah] and his charioteer, Krishna. Name this Hindu philosophical text, a sub-section of the *Mahabharata* [mah-hah-bah-rah-tah].

Bhagavad-Gita (prompt on
"Mahabharata" until "fight")



# Round # 4 Extra Section Toss-up Questions

#### Extra Question #3: Science - Health

10 points

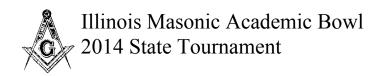
A genetic disease impacting the body's use of this element	<b>Zinc</b>
is acrodermatitis enteropathica [a-kroe-dehr-mah-TIE-tis	
en-TEH-roe-pa-thih-kah]. A deficiency in this nutrient	
contributes to anorexia and prevents the creation of	
testosterone. This nutrient is often found in high	
concentrations in the same foods that contain iron, calcium,	
magnesium, and proteins, including oysters and veal liver.	
Too much of this nutrient can prevent the body from using	
copper. Name this element whose oxide is used to decrease	
sunburn and which shortens cold symptoms.	

# Extra Question #4: Social Studies – U.S. History

10 points

In the unanimous opinion in this case, the Court drew comparisons to *Sweatt v Painter*, which lacked the "tangible factors" presented in this case. The cases of *Gebhart v Ethel* and *Briggs v Elliot* were combined with the namesake case in this decision. The attorney for the plaintiff argued that the Equal Protection Clause was violated due to the creation of an inferiority complex. This case overruled the doctrine established in *Plessy v Ferguson* of separate but equal. Name this landmark decision that ruled school segregation unconstitutional.

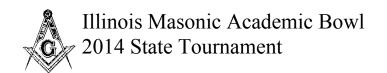
<u>Brown</u> v Board of Education of Topeka, KS



# Round # 4 Extra Section Toss-up Questions

# Extra Question #5: Fine Arts – Composers of the Modern Era 10 points

This composer did not allow a company to stage his	John <u>Cage</u>	
Europera 4 without staging his Europera 3. He used text		
from Finnegans Wake in his works Nowth upon Nacht, The		
Wonderful Widow of Eighteen Springs, and Roaratorio.		
This composer also created a series of five pieces called		
Imaginary Landscape, the fourth of which uses twelve		
radios. One of his pieces was first performed by David		
Tudor, who sat at a piano without playing it. Name this		
avant-garde composer of Four Minutes, Thirty-Three		
Seconds.		



# Round # 4 Extra Section Teamwork Questions

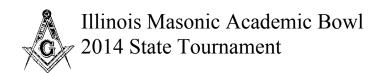
# Extra Question #6: Mathematics – Trigonometry

10 points per part

Ans	swer the following about angle addition formulas.	
1	Applying this trigonometric function to the sum of two angles is equivalent to evaluating this function on the angles separately, adding those function values together, and then dividing that sum by the quantity one minus the product of those values.	<u>tan</u> gent
2	If the sine of a first quadrant angle is three-fifths, find the sine of two times that angle.	<u>24/25</u> (or 0 <u>.96</u> )
3	If the cosine of an angle is zero, find the cosine of two times that angle.	<u>-1</u>

# Extra Question #7: Mathematics - Trigonometry

		, , ,
Co	nsider the six circular trigonometric functions.	
	Which two of the six are positive in the fourth quadrant?	
1		must be given without prompting in
1		either order, do not accept sine or
		cosecant)
	Which two of the six never have outputs between	<b>sec</b> ant and <b>cosecant</b> (both answers
2	negative one and one?	must be given without prompting in
		either order, accept <b>csc</b> in place of
		cosecant)
	Find the value of x in the first quadrant in radians for	pi/4 (or one-fourth pi or
3	which the secant of x equals the cosecant of x.	equivalents)
		- ·



# Round # 4 Extra Section Teamwork Questions

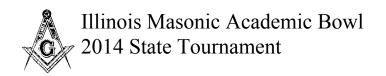
# Extra Question #8: Social Studies – World History

10 points per part

	s period was sparked by the assassination of Jorge	
Elie	ecer Gaitan [HOR-gay el-ee-EH-ser GIE-tahn].	
	Name this extended period of upheaval during which	La Violencia (do not accept
	Mariano Ospina Perez attempted to stifle the	"Bogotazo")
1	opposition Liberal Party. General Rojas Pinilla sought	,
	an end to it after taking over in a coup d'etat	
	[coo day-tah].	
	La Violencia claimed over 200,000 lives in this South	<u>Colombia</u>
2	American nation. During the presidency of Guillermo	
2	Leon Valencia, the ELN, a Marxist guerrilla group,	
	began an insurrection.	
	Around the same time that the ELN formed, this still-	FARC (accept Colombian
	active former Communist military wing formed out of	Revolutionary Armed Forces or
3	the "resistance committees" that began during La	Fuerzas Armadas
	Violencia. In 2008, Colombian troops invaded one of	Revolucionarias de Colombia)
	this group's camps in Ecuador.	

# Extra Question #9: Social Studies – World History

It is sometimes named for Dandi [DAHN-dee], where it concluded.		
1	Name the tax protest, a 240-mile journey from Sabermati [sah-ber-mah-tee] to the coast of the Arabian Sea. Upon arrival, its participants symbolically broke the law by picking up its eponymous [ih-PAH-nih-mus] substance along the shore.	Great <u>Salt March</u> (prompt on "Dandi March," accept <u>Salt</u> <u>Satyagraha</u> or <u>Gandhi Salt</u> <u>March</u> , but do not mention them)
2	The Salt March was led by this nationalist leader who was shot 18 years later by Nathuram Godse [na-thoo-rahm god-say].	Mohandas Karamchand Gandhi (accept Mahatma Gandhi)
3	The Salt March was an embodiment of this form of protest, advocated by Gandhi. Drawing from the Jain [jane] concept of <i>ahimsa</i> [ah-him-sah], it mandates non-violent resistance to evil.	satyagraha (prompt on "insistence for truth" or equivalents)



### Round # 5 1<sup>st</sup> Section Toss-up Questions

#### **Question #1: Miscellaneous – Industrial Arts**

10 points

In the early stages of this process, the wellbore is broken up with diluted acid, then filled with slickwater. Pits are used to hold used up fluids as well as waste, but those pits are not required by the EPA. This process primarily targets shale several thousand feet below the surface. Name this controversial process in which high-pressure water and chemicals are used to extract oil and gas.

fracking (accept induced
hydraulic fracturing or
hydrofracturing)

#### **Question #2: Science – Biology**

10 points

The inclusive type of this property is addressed by Hamilton's Rule, which multiplies the benefit to the recipient of an altruistic act by the genetic relatedness to the actor. An example of the inclusive type of this property is kin selection, and this is used to explain the continued existence of bees, ants, and other organisms studied by sociobiologists. The absolute measure of this property is the ratio of the number of individuals after and before selection. Name this quality of certain populations to survive and reproduce.

(Darwinian or evolutionary) <u>fitness</u> (accept <u>adaptive value</u>, <u>selective</u> <u>value</u>, or <u>adaptability</u>, prompt on ability to "survive" or "altruism")

## Round # 5 1<sup>st</sup> Section Toss-up Questions

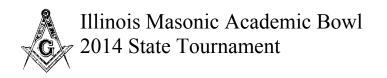
# **Question #3: Social Studies – World History**

10 points

The Treaty of Zanjon [zahn-HONE] ended a ten-year fight	<u>Cuba</u>
for independence in this country, which began when the	
"Cry of Yara" was issued by Carlos Manuel de Cespedes	
[ses-PEH-dehs]. The US backed this nation's "sergeants"	
revolt" that overthrew Gerardo Machado and installed a	
leader who was later overthrown by the 26th of July	
Movement. That leader was Fulgencio Batista, and the	
movement was supported by Che Guevara. Name this nation	
whose government was overthrown in 1959 by Fidel Castro.	
, ,	

# **Question #4: Mathematics – Math Concepts**

A linear combination of vectors is said to be this type of	convex	
combination if the coefficients add to one and are all non-		
negative. If a function with a continuous second derivative		
has this property, then it is concave up. If a polygon with n		
vertices has this property, then its number of interior		
diagonals equals one-half times n times the quantity n minus		
three. If a set of points has this property, then it contains the		
entirety of all segments connecting two of its points. Name		
this property belonging to polygons whose interior angles		
are all less than 180 degrees.		



# Round # 5 1<sup>st</sup> Section Toss-up Questions

#### **Question #5: Literature – British Literature**

10 points

This play pulls material from Plautus' [PLAH-tus-es]	The <u>Comedy of Errors</u>
Menaechmi [meh-NIEK-mee] and John Gower's	
Apollonius [a-po-LOE-nee-us] of Tyre [tire]. The	
protagonists of this play were born at Epidamnum	
[eh-pih-DAM-num], and were raised separately by	
Aemilia and Aegeon [AE-jee-on] following a storm. The	
centerpiece of this play's plot was Solinus' extension	
regarding a thousand-mark fine or execution. Solinus, the	
Duke of Ephesus [eh-FEE-sus], was talking about a	
merchant from Syracuse. Name this Shakespeare comedy	
about the mass confusion resulting from two sets of long-	
lost twins.	

#### **Question #6: Science – Earth Science**

	1
The size of this atmospheric layer can be measured by	<u>troposphere</u>
observing aerodynamic drag on satellites, and this layer	
became much smaller in 2008 and 2009. The location of the	
International Space Station, this area and the ionosphere	
[ie-ON-uh-sfehr] are the target of storm probes being sent	
up by NASA. The ionosphere goes throughout the altitude	
of this region in addition to some areas above and below it.	
This layer is the primary location of auroras. Name this	
region above the mesopause [MEH-soe-paws] named for its	
high temperatures.	

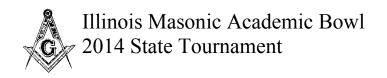
# **Question #7: Social Studies – Current Events**

10 points per part

		s financial giant came under intense scrutiny after a eadsheet detailed its "Sons and Daughters" program.	
		Name this bank headed by Jamie Dimon [DIE-mon]	JPMorgan Chase
-	L	that was also hit with billions of dollars in fines following the "London whale" trading scandal.	
2		JPMorgan Chase faced bribery investigations	People's Republic of <u>China</u>
	2	concerning the hiring of children of powerful politicians in this nation. They made payments to Lily	
		Chang, whose real name was Wen Ruchun.	
		The SEC's investigation concerned potential violations	Foreign Corrupt Practices Act
•	3	of this act, which forbids bribery of foreign officials.	

#### **Question #8: Social Studies – Current Events**

	father came to power after having Salah al-Jadid	
arre	ested.	
	Name this Alawite President of Syria who lost both his	President Bashar al- <b>Assad</b>
1	Minister of Defense and brother-in-law in July 2012	
	when a bomb went off inside a government building.	
	Due in large part to a reaction against events in Syria,	Organisation for the Prohibition
2	this organization was awarded the 2013 Nobel Peace	of Chemical Weapons (or
	Prize.	<u>OPCW</u> )
	After the assassination of Rafik Hariri [rah-FEEK	<b>Lebanon</b>
3	hah-REE-ree] in 2005, Syria was forced to remove	
	occupying forces from this nation.	



# **Question #9: Science – Physics**

10 points per part

Thi	s quantity is measured in charge per time.	
1	Name this quantity often measured in amperes.	electric(al) <u>current</u>
2	This Prussian scientist is the namesake of two circuit laws used to find currents, the junction rule and the loop rule.	Gustav Kirchhoff
3	This two-word phrase is used for the average speed of an electron that is part of an electric current.	<u>drift velocity</u> (or <u>drift speed</u> )

# **Question #10: Science – Physics**

The	ese devices typically have iron cores.	
1	Name these devices that have two coils of wire that are useful because the electromotive forces of the wires are proportional to the number of loops.	<u>transformer</u> s
2	Transformers only work in this type of circuit, which was supported heavily by George Westinghouse and Nikola Tesla against the wishes of Thomas Edison.	alternating current (or AC)
3	These devices convert alternating current to direct current.	<u>rectifier</u> s

#### **Question #11: Literature – World Literature**

10 points per part

Wh	ile eating dinner with a professor and the professor's	
wif	e, the couple lambasted his column concerning German	
gui	lt for World War I.	
	Name this protagonist who then responded by	Harry Haller (accept either,
1	ridiculing a painting of Goethe [GOE-teh]. Near the	prompt on, but do not say,
1	end of the novel, he stabbed Hermine [hehr-MEE-nuh],	"Steppenwolf")
	whose body was shrunk to figurine size by Pablo.	
	Harry Haller encounters a sign that reads "For Madmen	Der <u>Steppenwolf</u>
2	Only" in this novel.	
	Steppenwolf was written by this author of Siddhartha.	Hermann Hesse
3		

#### **Question #12: Literature – World Literature**

	s character's attempt to head home early from a trip was rarted due to his belongings ending up in Como.	
	Name this writer who encounters a comedian who	Gustav von Aschenbach
1	reminds him of a rouged [roojd] old man, and a man	
	who stood in the doorway of a mortuary chapel.	
	The encounter in the graveyard inspired Gustav von	<u>Venice</u> , Italy
2	Aschenbach to travel to this city, where the writer	
	stayed at the Hotel des Bains.	
	Gustav von Aschenbach is the protagonist of this	Thomas Mann
3	German author's novel Death in Venice.	

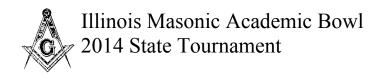
# **Question #13: Mathematics – Trigonometry**

10 points per part

Ans	swer these questions about triangle areas.	
1	Give the area of a triangle if it has a side of length 2, a side of length 4, and a 30 degree angle between those two sides.	2
2	In general, the area of a triangle can be found by applying this function to the angle between two sides and multiplying the result times half the product of the lengths of those sides.	<u>sin</u> e
3	Find the area of a triangle if it has a side of length 6, a side of length 7, and a 90 degree angle between those	<u>21</u>

# **Question #14: Mathematics – Trigonometry**

	swer these questions regarding the relationship between le and slope.	
1	Find the angle in degrees that a line makes with the positive x-axis if the slope of the line is the square root	<u>60</u> degrees
2	of 3.  The slope of a line is equal to this trigonometric function applied to the angle between the line and the positive x-axis.	<u>tang</u> ent
3	Equivalently, the slope of a line is equal to this trigonometric function applied to the angle between the line and the positive y-axis.	<u>cot</u> angent



### Round # 5 3<sup>rd</sup> Section **Toss-up Questions**

#### **Question #15: Social Studies – U.S. History**

10 points

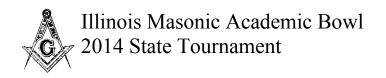
A 19 <sup>th</sup> century mayor of this city, Henry Perrin Coon, was	San Francisco, California	
supported by a militia called the Committee of Vigilance.		
The international meeting that formally established the UN	1	
was held in this city. This city's "White Night Riot"		
occurred following a trial which saw the use of the		
"Twinkie defense." Dianne Feinstein became mayor of this	s	
city following Dan White's shooting of George Moscone		
[mos-KOE-nee] and Supervisor Harvey Milk. Name this		
California city, site of the Golden Gate Bridge.		

#### **Question #16: Literature – Mythology**

10 points

At Aulis [AW-lis], one group was delayed in its voyage to this conflict due to Artemis [AHR-teh-mis] sending an unfavorable wind. During this conflict, the horses Xanthus and Balius [BAHL-yus] were struck dumb by the Furies. As prophesied, Protesilaus [proe-teh-SIH-laus] was the first to die during it, as he was the first on land. Helenus [HEL-uh-nus] was forced to reveal what would bring about the end of it, which included capturing the Palladium [puh-LAY-dee-um] statue. This conflict was sparked by Paris' kidnapping of Helen. Name this decade-long conflict which saw the invading Greeks conquer a city in Asia Minor, the subject of *The Iliad*.

#### Trojan War



### Round # 5 3<sup>rd</sup> Section Toss-up Questions

#### **Question #17: Science – Chemistry**

10 points

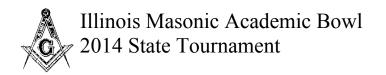
In 2013, bismuth was used by Joel Rosenthal as a catalyst to create this compound. This compound is combined with water vapor in the water-gas shift reaction, and this is mixed with hydrogen to make synthetic fuel in the Fischer-Tropsch [tropsch] process. This compound combines with hemoglobin to create carboxyhemoglobin [kahr-BOK-see-hee-moe-gloe-bin], which causes oxygen deprivation. Name this compound that can be created by incomplete combustion so that there is not enough oxygen to create carbon dioxide.

#### **Question #18: Social Studies – Geography**

10 points

John Woodruff and Cyrus Avery founded a national association to promote the use of this road, and CC Pyle organized the "Bunion Derby" which was set on it. In *The Grapes of Wrath*, this road was called the "Mother Road." Once called the "Main Street of America," a song sung by Nat King Cole implored the listener to "get your kicks on" this road. Name this historic highway that ran from Chicago to Santa Monica, California.

US Route <u>66</u> (accept <u>Highway 66</u> or Will <u>Rogers</u> Memorial Highway)



# Round # 5 3<sup>rd</sup> Section Toss-up Questions

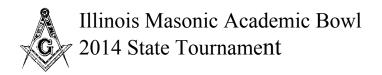
#### **Question #19: Literature – World Literature**

10 points

In Aristotle's <i>Poetics</i> , this playwright was said to present	<b>Euripides</b>
individuals as they are, not as they should be. In one of his	
plays, Athena ordered Thoas [THOE-az] to not defy the will	
of Apollo, who had sent a Greek to capture a statue of	
Artemis. Another of his plays saw Menoeceus [meh-noe-	
KAY-us] and Jocasta stabbing their own throats, the latter	
following the dual murder of Eteocles [eh-TEE-oe-klees]	
and Polyneices [po-lee-NAY-kees]. This author of <i>Iphigenia</i>	
[if-ih-jeh-NEE-uh] in Tauris and The Phoenician Women	
also wrote of Pentheus' attempts to use reason, and suffering	
at the hands of Dionysus' [die-oe-NIE-sus-es] followers.	
Name this author of <i>The Bacchae</i> .	

# **Question #20: Fine Arts – Classical/Opera**

A song in this opera comparing the black eyes of one	<u>Tosca</u>
woman to the blue eyes of a woman posing for a painting is	
Recondita Armonia. The title character in this opera asks	
why she has suffered misfortune despite her sincere faith in	
Vissi d'arte [AHR-tay]. The singer of the song about eyes,	
who also sings "E lucevan le stele [eh LOO-chay-van lay	
STEH-lay]," is the painter Mario Cavaradossi	
[kah-vah-rah-DOE-see]. Name this opera also featuring	
Police Chief Baron Scarpia, a work by Giacomo Puccini	
[jah-KOE-moe poo-CHEE-nee].	
- · ·	



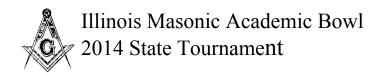
# Question #21: Social Studies – U.S. History

10 points per part

Its	victims included Frank and Pete Gusenberg.	
1	Name this 1929 mass murder of unarmed bootleggers by gangsters disguised as policemen.	Saint Valentine's Day Massacre (prompt on "Valentine's Day" Massacre)
2	The St. Valentine's Day Massacre was perpetrated in this city by members of Al Capone's gang.	Chicago, Illinois
3	The victims of the Massacre were members of this man's gang. Along with Earl Weiss, he inherited the gang left behind by Dion O'Bannion.	George "Bugs" Moran

# **Question #22: Social Studies – U.S. History**

Uno	der Franklin Pierce, he was chosen as minister to Britain.	
1	Name this man who worked with William Marcy in drafting the Ostend Manifesto. During a presidential campaign, he was jeered as "ten-cent Jimmy" for claiming that ten cents per day was sufficient for a working man.	James <u>Buchanan</u>
2	Buchanan oversaw the annexation of Texas as Secretary of State for this President.	James Knox Polk
3	During his campaign for President, Polk promulgated this slogan as a response to the Oregon question, indicating how far north the border should be.	"Fifty-four Forty or Fight"



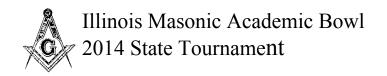
# **Question #23: Mathematics – Algebra**

10 points per part

	s set of numbers is sometimes represented by a double ack Z to represent the German word Zahlen [ZAH-len].	
1	Name this set that includes all of the whole numbers and their additive inverses.	<u>integer</u> s (or <u>integer number</u> s)
2	This name is given to a class of problems that requires integer solutions. Give either the name of the equations or the name of the third century mathematician they are named for.	<u>Diophantine</u> (or <u>Diophantus</u> of Alexandria)
3	A famous Diophantine [DIE-oh-fahn-teen] equation is $a^2+b^2=c^2$ . If a, b, and c are all positive integers, then what is the smallest possible value of c?	5

# **Question #24: Mathematics – Algebra**

Thi	s process is most straightforward when the divisor is ear.	
1	Name this method of dividing polynomials in which the coefficients of the dividend are written across the top, to the right of the number that is subtracted from x in the divisor.	synthetic division
2	Find the remainder when the quantity $x^3+x^2+x+1$ is divided by the quantity x-1. Your answer should be just an integer, so do not express your answer as a fraction.	<u>4</u>
3	Leaving out the term generated by the remainder, find the polynomial quotient from the same problem, namely the quantity $x^3+x^2+x+1$ is divided by the quantity x-1.	$\underline{\mathbf{x}^2+2\mathbf{x}+3}$



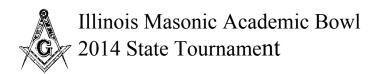
#### **Question #25: Literature – British Literature**

10 points per part

He	strangled Bernardine, then framed Friar Jacomo for the	
mu	rder. He also used his daughter to bring about the deaths	
of I	Oons Lodowick and Mathias.	
	Name this character who, after being imprisoned by	Barabas (accept The Jew of
1	Ferneze [fer-NEH-zay], used poppy essence and	Malta, but do not mention it)
1	mandrake root to fake death. He was undone by a trap	
	he set for Turkish troops.	
	Barabas is the protagonist of this late 16 <sup>th</sup> century play,	The <b>Jew of Malta</b>
2	which sees him fall into a pot of boiling oil at its	
	resolution.	
	The Jew of Malta was written by this dramatist. This	Christopher Marlowe
3	writer invites the reader to "come live with me and be	
3	my love" in the poem "The Passionate Shepherd to His	
	Love."	

#### **Question #26: Literature – British Literature**

	s fictional locale is home to Upper Weatherbury Farm the King's Arms Hotel.	
1	Name this county that contains Buck's Head Inn. One resident of this county abandoned his wife and left for Brazil, only to return shortly before she was hanged.	Wessex, England
2	This is the woman whose husband Angel Clare went to Brazil. Upon her husband's return, she kills Alec.	<u>Tess Durbeyfield</u> (accept either underlined part, accept <u>Tess of the d'Urbervilles</u> )
3	The fictional county of Wessex served as the setting for many of the works of this author of <i>Tess of the d'Urbervilles</i> , <i>Far From the Madding Crowd</i> and <i>Jude the Obscure</i> .	Thomas <u>Hardy</u>



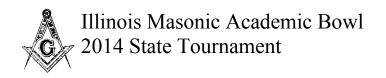
# **Question #27: Fine Arts – Art History**

10 points per part

Thi	s school existed from 1919 to 1933.	
	Name this school started by Walter Gropius	Staatliches Bauhaus
1	[GROE-pee-us] that started in Weimar [VIE-mahr] and	
	ended in Berlin.	
	In between its time in Weimar and Berlin, the school	<b>Dessau</b> , Germany
2	spent seven years in this city, where it met in a building	
	designed primarily by Gropius.	
	This person was the last leader of the school. He was	Ludwig Mies van der Rohe
3	later a leader at the Illinois Institute of Technology and	(prompt other parts of answer)
	designed the Farnsworth House in Plano, Illinois.	

# **Question #28: Fine Arts – Art History**

		io ponto poi part
His	bright red stabile in Chicago is <i>Flamingo</i> .	
1	Name this sculptor who also created many mobiles.	Alexander <u>Calder</u>
2	Calder made this mobile for the stairwell of the Museum of Modern Art.	Lobster Trap and Fish Tail
3	This large Calder work combining a stabile and a mobile is in the Hart Senate Office Building.	Mountains and Clouds



### Round # 5 5<sup>th</sup> Section Toss-up Questions

#### **Question #29: Social Studies – World History**

10 points

One king of this country was killed at the Battle of the Three Kings in a failed attempt to conquer Morocco. The Castilian right to the throne of this country was lost at the Battle of Aljubarrota [ahl-joo-bah-ROE-tah], where English archers backed the forces of John the First of Aviz [ah-VEEZ]. The MFA launched a 1974 coup in this country known as the Carnation Revolution. It continued to support exploreers such as Vasco de Gama [GAH-mah] after the death of Henry the Navigator. Name this country where in 1755 an earthquake struck the capital, Lisbon.

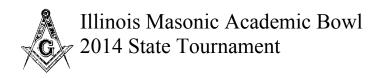
Portugal (accept Portugese Republic or Republica Portuguesa)

#### **Question #30: Science – Physics**

10 points

This value is quantized so that it must equal an integer times the reduced Planck constant. Its components do not commute, so they are complementary variables in Heisenberg's Uncertainty Principle. Its derivative with respect to time, which can be found using the product rule, gives one term equal to zero and the other equal to torque. This conserved quantity equals moment of inertia times angular velocity. Name this quantity equal to the cross product of position with linear momentum.

angular momentum (do not accept
"momentum")



## Round # 5 5<sup>th</sup> Section Toss-up Questions

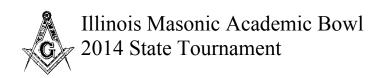
#### **Question #31: Literature – U.S. Literature**

10 points

This writer apologized for not following Ford Madox Ford's	James <u>Thurber</u>
dictum regarding memoirs in My Life and Hard Times. He	
wrote of a non-smoker buying a pack of cigarettes as part of	
a plan to kill Mrs. Ulgine [OOL-jeen] Barrows in "The	
Catbird Seat." In another story, this author wrote of a	
character who refused to see Dr. Renshaw, whom that	
character then imagines referring a patient to him. That	
same character later imagines himself facing a firing squad.	
Name this author of "The Secret Life of Walter Mitty."	

# **Question #32: Mathematics – Math Concepts**

The Bienayme [byen-ae-may] formula states that two values	(sample or population) variance
of this quantity can be added to find the new value when	
two uncorrelated random variables are added or subtracted.	
In the central limit theorem, this variable is divided by the	
number of samples. This quantity is equal to the expected	
value of the quantity variable squared, end quantity, minus	
the expected value squared. In a Poisson [pwie-sone]	
distribution, this quantity equals the expected value. The	
units of this quantity are found by squaring the units of the	
variable. Name this measure of spread whose square root	
equals standard deviation.	



# Round # 5 Extra Section Toss-up Questions

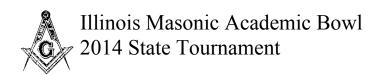
# Extra Question #1: Fine Arts – Art History

10 points

This artist's portrait of his wife Margaret shows her with a	Jan van <b>Eyck</b> (or Johannes de
white headdress and what appear to be horns of coiled hair.	Eyck)
That same hair arrangement can be seen in another portrait	
by this artist, in which a woman wearing a green dress over	
a blue underdress has her left hand just over her stomach	
and her right hand held by a man. This artist also worked	
with his brother Hubert on <i>The Adoration of the Mystic</i>	
Lamb, which is also known as the Ghent [gent] Altarpiece.	
Name this Flemish painter of <i>The Arnolfini</i>	
[ahr-noel-FEE-nee] Wedding.	

# Extra Question #2: Mathematics – Math Concepts

This is the least restrictive quadrilateral for which the sum	rectangle
of the squares of the distances from any point in the interior	
to two opposite diagonals equals the same sum for the other	
opposite diagonals. It is also the least restrictive	
quadrilateral for which the intersection of the diagonals is	
the same distance from each of the four vertices. Its four	
angles are all congruent, but its sides are not necessarily	
congruent. Name this quadrilateral with four right angles.	



# Round # 5 Extra Section Toss-up Questions

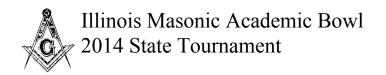
# Extra Question #3: Literature – U.S. Literature

10 points

This novelist wrote of the tale of Fray Baltazar, whose	Willa <u>Cather</u>
exploits were described to a man on his way to the mesa at	
Acoma [ah-KOE-mah]. Earlier in that novel, Magdalena	
reported the murders committed by her husband Buck	
Scales. She also wrote of a Bohemian peasant taken in by	
Mrs. Harling at the insistence of the grandmother of Jim	
Burden. Name this author of <i>Death Comes for the</i>	
Archbishop and My Antonia.	

# Extra Question #4: Science – Physics

Shortly after Yuri Manin [MAH-neen] wrote Computable	Richard Feynman	
and Uncomputable, this scientist gave a talk titled		
"Simulating Physics with Computers" that discussed		
building a quantum computer. Based on work with John		
Archibald Wheeler, this scientist developed the use of path		
integrals. Freeman Dyson showed that this person's work on		
quantum electrodynamics was equivalent to work by		
Tomonaga and Schwinger [SHWEENG-er]. Name this		
person who used arrows and wavy lines to demonstrate		
quantum interactions in his namesake diagrams.		



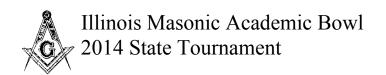
# Round # 5 Extra Section Toss-up Questions

# Extra Question #5: Social Studies - U.S. History

10 points

Ex Parte [PAHR-tay] Young created the Stripping Doctrine,		
an exception to this amendment involving unconstitutional		
acts that allows for injunctive relief. The scope of this		
amendment was expanded by the decision in <i>Hans v</i> .		
Louisiana. This amendment was passed in reaction to the		
ruling in <i>Chisholm v. Georgia</i> . Name this constitutional		
amendment that established the sovereign immunity of the		
states, the first amendment passed after the Bill of Rights.		
, ,		

<u>Eleven</u>th Amendment to the United States Constitution



# Round # 5 Extra Section Teamwork Questions

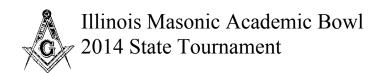
# Extra Question #6: Literature – U.S. Literature

10 points per part

	his story, Ying-ying confides in the Moon Lady, ang-o, only to learn that Chang-o is a man.	
1	Name this novel in which Jing-mei replaces her mother in a mah-jongg game.	The Joy Luck Club
2	The Joy Luck Club was written by this author of The Kitchen God's Wife.	Amy Ruth <u>Tan</u>
3	In <i>The Joy Luck Club</i> , Waverly Jong was named after a location in this city. More successful families moved to its Ashbury Heights neighborhood.	San Francisco, California

#### Extra Question #7: Literature – U.S. Literature

	s attorney began to hate Julius Beaufort [BOE-fort] en the businessman began pursuing his cousin.	
1	Name this husband of May Welland who moved up the date of his wedding in order to curb his feelings for a countess who had returned from Poland.	Newland Archer (accept either)
2	Newland Archer pursued a relationship with Ellen Olenska while engaged to May in this novel.	The Age of Innocence
3	The Age of Innocence was written by this author of The House of Mirth.	Edith <u>Wharton</u> (accept Edith Newbold <u>Jones</u> )



# Round # 5 Extra Section Teamwork Questions

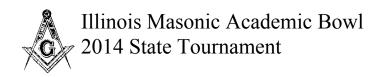
# Extra Question #8: Science – Biology

10 points per part

The	e embryonic type of these is found inside blastocysts	
[BI	AS-toe-sists], while the adult type is found in bone	
ma	rrow and a few other places in the body.	
	Name these cells whose study has been politically	stem cells
1	controversial.	
	Ranking between totipotency [toe-teh-POE-ten-see] and	<u>pluri</u> potency (or <u>pluripotent</u> )
2	multipotency, this term refers to the ability of many	
	stem cells to differentiate into nearly any cell.	
	This adjective is used in an alternative name for adult	<u>somatic</u>
3	stem cells. This adjective is also used for any cell that is	
	not a gamete or closely related to gametes.	

# Extra Question #9: Science – Biology

	blems with this chromosome can cause hemophilia or or blindness.	
1	Name this chromosome. Generally, women have two of them, but men only have one.	X chromosome(s)
		TZI' 6 I4 ( 1
2	This syndrome leading to low fertility males is caused by a person having two X chromosomes and a Y	Klinefelter's syndrome
	chromosome.	
	This gene on the X chromosome plays a major role in	Xist (or X-inactive specific
3	lionization [lie-un-ih-ZAY-shun]. Research by Jeanne	<u>transcript</u> )
	Lawrence published in 2013 suggest that this gene may	
	be able to cancel the effects of trisomies.	



#### Round # 6 1<sup>st</sup> Section Toss-up Questions

#### **Question #1: Science – Chemistry**

10 points

This scientist's last paper, written with one of his students, used Fenton chemistry to explain the generation of hydroxyl [hie-DROK-sil] radicals from hydrogen peroxide and superoxide. In addition to that work with Joseph Weiss, this scientist worked with Max Born on a method to calculate lattice energies, which is known as their cycle. In 1909, this person used osmium as a catalyst in a very high pressure reaction that combines hydrogen and nitrogen. Name this scientist whose process for creating ammonia was improved by Carl Bosch.

# **Question #2: Language Arts – Grammar/Usage**

10 points

In the Estonian alphabet, W immediately precedes an O with this diacritical mark. In Vietnamese, this mark is used to indicate a vowel with a higher tone. This mark can be placed above the letter G in the Guarani language. In Portuguese, this is utilized above the letters O and A to show that the speaker should use more nasalization when pronouncing the letter. Name this diacritical mark used as a part of a letter in the Spanish alphabet, where it appears over the letter ene [EHN-ay] to form the letter enye [EHN-YAY].

<u>tilde</u> (accept <u>flourish</u> or <u>swung</u> <u>dash</u>, prompt on "squiggly", do not accept "dash")

### Round # 6 1<sup>st</sup> Section Toss-up Questions

# **Question #3: Social Studies – U.S. History**

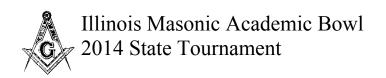
10 points

Iconic photos of this event were taken by Bill Eppridge, including that of busboy Juan Romero holding the victim. Its perpetrator claimed he was driven by his target's desire to send jets to Israel. It occurred shortly after its victim had claimed victory in a California presidential primary. Perpetrated by a Jordanian immigrant, name this action at the Ambassador Hotel in Los Angeles by Sirhan Sirhan against a candidate for President in 1968.

assassination of Robert Kennedy (accept synonyms for assassination, the player must give at least part of the first name, prompt if not given, accept Bobby in place of Robert)

### **Question #4: Miscellaneous – Technology**

Virgil Griffith developed a tool to detect conflicts of interest	Wikipedia.org	
in relation to this website. In April 2013, one of its		
volunteers was threatened by the DCRI, a French		
intelligence agency, over information about a military radio		
station. Software called Xowa [KSOE-wah] allows users to		
view this website's contents while offline. This was founded		
by Larry Sanger and Jimmy Wales in 2001, and a 2005		
article in <i>Nature</i> magazine compared the accuracy of its		
science content to Encyclopedia Britannica. Name this		
"Free Encyclopedia."		



# Round # 6 1<sup>st</sup> Section Toss-up Questions

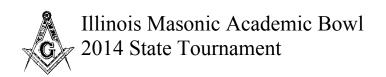
#### **Question #5: Science - Health**

10 points

The most common fungal cause of this disease is	<u>meningitis</u>
Cryptococcus, and a common bacterial cause is from the	
same genus [JEE-nus] that causes gonorrhea, which is	
Neisseria [nie-SEHR-ee-uh]. This disease is now less	
common due to the influenza B vaccine. The most common	
causes are viral, and this can be diagnosed by finding low	
glucose and high protein and lymphocyte [LIM-foe-site]	
levels in the fluid drawn from a spinal tap. This disease	
generally causes strong headaches and neck stiffness. Name	
this inflammation of the membranes around the brain and	
spinal cord.	
-	

# Question #6: Social Studies – Religion

According to Armenian legend, this person planted a long	Abel
kiss on his mother's arm when ordered to bite it. In some	
Islamic sources, this person was born at the same time as	
Kelimia, and was slated to marry Lubda. In the Book of	
Matthew, Jesus compared the death of this person to the	
death of Zachariah son of Barachiah. The first shepherd, he	
sacrificed to God the firstlings of his flock, and the result	
drew the ire of his brother. This is the first person to die in	
The Bible. Name this second son of Adam and Eve, the	
brother of Cain.	



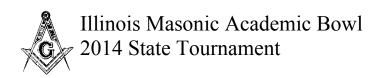
## **Question #7: Mathematics – Algebra**

10 points per part

Dep	s set is often contrasted with the domain of a function. bending on context, this term can be equivalent to the	
cod	omain or the image.	
1	Name this set of function outputs.	<u>range</u>
2	This term, a synonym of onto, is used to describe functions that have an image equal to their codomain. This can be described as the function using its entire range.	surjective (accept surjection)
3	Give the only real number that is not in the range, or image, of the function the quantity x+2, end quantity, divided by the quantity x+5.	1

## **Question #8: Mathematics – Algebra**

	relationship between two variables is often a type of fation.	
1	Name the type of variation which exists when one variable increasing causes the other variable to also increase.	<u>direct</u> variation
2	If y varies directly with x, and y=10 when x=8, then find the value of y when x=12.	<u>15</u>
3	If y varies directly with the cube of x, and y=10 when x=2, the find the value of y when x=8.	640



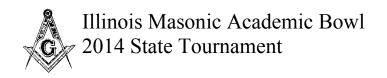
## **Question #9: Social Studies – World History**

10 points per part

	e main goal of this 1944 conference was to rectify iciencies of the international use of the gold standard.	
	Name this conference used to set up a system which	Bretton Woods Conference (or
1	used the US Dollar as the reserve currency. Its namesake system came to an end when President Nixon put a stop to the sale of gold.	United Nations Monetary and Financial Conference)
2	The Bretton Woods Conference set out the plans for the creation of two organizations; one is a source of long-term capital for states reliant on foreign aid, the other looks to correct short-term exchange rate fluctuations. Name either.	World Bank or International Monetary Fund (accept IMF) or International Bank for Reconstruction and Development (accept IBRD)
3	The Uruguay Round organized under the auspices of this agreement laid the groundwork for the creation of the World Trade Organization. This outgrowth of the Bretton Woods Conference focused on international commerce.	General Agreement on Tariffs and Trade (accept GATT)

#### **Question #10: Social Studies – World History**

As	Prime Minister, this successor to Winston Field issued a	
Un	ilateral Declaration of Independence, which was rejected	
by	Great Britain.	
	Name this leader who reversed his attempt to enshrine	Ian Douglas <u>Smith</u>
	white minority rule when international pressure	
1	compelled him to negotiate with the United African	
	National Council, led by Abel Muzorewa [ay-bel	
	muz-oe-rae-wah].	
	Ian Smith's declaration led to the creation of this	Rhodesia (accept Southern
	republic that lasted for fourteen years. Earlier, it was	Rhodesia, do not accept
2	part of a federation that included modern-day Zambia	"Zimbabwe")
	as well as Nyasaland [NYAH-sah-land], which is now	
	Malawi.	
	After blacks gained majority rule, Rhodesia became	Republic of Zimbabwe
3	this modern-day country. Since its founding, Robert	
3	Mugabe [moo-GAH-bay] has held the title of	
	President.	



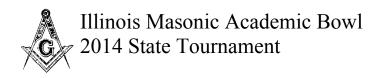
#### **Question #11: Fine Arts – Jazz**

10 points per part

Naı	me these jazz standards.	
1	This Billy Strayhorn song performed by Duke Ellington and many others is about transportation going to Harlem.	"Take the 'A' Train"
2	This song from Porgy and Bess talks about when the "livin' is easy, Fish are jumpin', And the cotton is high."	"Summertime"
3	This song written for Gertrude Lawrence but performed by many artists includes the lyrics, "I tell you I mean it, I'm all for you."	"Body and Soul"

#### **Question #12: Fine Arts – Jazz**

	s trumpeter and singer won a Grammy for his recording Hello, Dolly!"	
1	Name this musician nicknamed Satchmo.	Louis Armstrong
2	This song by Armstrong has a title that states what the narrator thinks to himself after seeing, "Trees of green, red roses too."	"What A Wonderful World"
3	A probably false legend states that Armstrong invented scat when he dropped his sheet music for this song about a dance with a strange name.	"Heebie Jeebies"



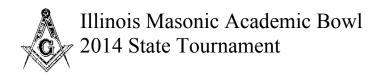
## **Question #13: Science – Chemistry**

10 points per part

Cat	alysts are used in many reactions.	
1	Catalysts lower this energy found in the exponent in the Arrhenius [uh-REE-nee-us] equation.	activation energy
2	This name is given to substances that lower the rate of a reaction, sometimes by reducing the impact of a catalyst.	`
3	These two people are the namesake of catalysts used to polymerize olefins [OH-luh-fins].	(Giulio) <u>Natta</u> and (Karl) <u>Ziegler</u> (must give both names in either order without prompting)

## **Question #14: Science – Chemistry**

The	ese solids are often contrasted with amorphous solids.	
1	Name these solids whose molecules are in an ordered pattern.	<u>crystal</u> s (or <u>crystal</u> solid(s) or <u>crystalline</u> or <u>polycrystal</u> line)
2	This name is given to the arrangement of atoms in a crystal. This same term is used in mathematics for the points with integer coordinates on a graph.	<u>lattice</u> (accept longer answers)
3	The 14 different crystal lattices are named for this 19 <sup>th</sup> century Frenchman.	Auguste <u>Bravais</u>



#### Round # 6 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Mathematics – Math Concepts**

10 points

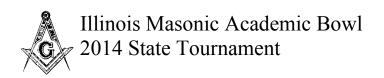
Russell's paradox was developed to discredit one of this mathematician's theorems. The function named for this person has a derivative that is Lebesgue [lah-BEG] integrable, but that integral does not equal the change of the function. That function, which is not absolutely continuous, can be called the Devil's staircase, and it is based on repeatedly removing middle thirds to form this mathematician's namesake set. Name this person who showed real numbers are not countable by diagonalization and who discovered transfinite numbers.

#### Question #16: Literature – U.S. Literature

10 points

One of this writer's plays was based on the fairy tale *Snow White and Rose Red*, and centers on the stepsisters Bianca and Beatrice. In another work by this writer of *The Lamp and the Bell*, a woman who looked "nineteen, and not a day older" stayed up the night before Christmas making clothes for her son. This writer "had a little Sorrow, Born of a little Sin" in the poem "The Penitent." This poet and playwright wrote that "my candle burns at both ends" in the first poem of *A Few Figs From Thistles*. Name this author of "Ballad of the Harp-Weaver" and *Renascence* [reh-NA-sens], *and other Poems*.

Edna St. Vincent <u>Millay</u> (accept Nancy <u>Boyd</u>)



#### Round # 6 3<sup>rd</sup> Section Toss-up Questions

#### **Question #17: Science - Physics**

10 points

This concept has been more successful than Modified Newtonian [new-TOE-nee-un] dynamics at explaining the galaxy rotation problem. An equation relating average kinetic energy to potential energy called the virial [VEHR-ee-ul] theorem and observations of the Coma cluster were used by Fritz Zwicky in 1933 to predict the existence of this substance. Accounting for about 27 percent of the mass-energy of the universe, identify this substance that does not absorb or emit light and therefore cannot be seen directly.

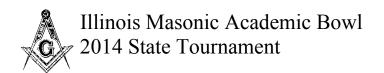
<u>dark matter</u> (do not accept "dark energy")

#### **Question #18: Social Studies – U.S. Government**

10 points

In the Magna Carta, the use of this power required immediate cash appropriation. A state supreme court weakened a federal supreme court decision on this matter in *Norwood, Ohio v. Horney*. That Supreme Court decision, which found that this power can be used in the name of economic development as long as it is in the "public interest," is *Kelo* [KEE-loe] *v. New London*. Some countries refer to this power as compulsory purchase. Authorized by the Fifth Amendment takings clause, name this ability of the government to appropriate private property while compensating the owner.

eminent domain (accept compulsory purchase before it is mentioned, do not accept "confiscation")



#### Round # 6 3<sup>rd</sup> Section Toss-up Questions

#### **Question #19: Fine Arts – Art History**

10 points

This city is the home of Sassetti [sah-SEH-tee] Chapel, which contains works by Domenico Ghirlandaio [gehr-lahn-DIE-oh] and which is in a church that used to hold the Santa Trinita Maesta [my-STAH] by city resident Cimabue [chim-ah-bway]. This city also contains Fra Angelico's [ahn-JEH-lee-koe's] Altarpiece for San Marco. This is also the home of the Galleria dell'Accademia and the Ponte Vecchio [POEN-tay VEH-kee-oe] Bridge. Its Baptistery di San Giovanni contains works by Andrea Pisano and Lorenzo Ghiberti, including the doors nicknamed Gates of Paradise. Its large cathedral has a dome designed by Filippo Brunelleschi [broo-nehl-LEH-schee]. Name this Italian city in Tuscany whose largest museum is the Uffizi [oo-FEE-zee].

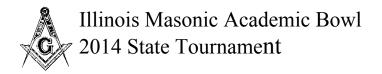
Florence, Tuscany, Italy

#### **Question #20: Literature – Mythology**

10 points

In the *Iliad*, Homer wrote that this god's wife was the youngest Grace, Aglaea [ah-GLAY-uh], after his divorce. During the Trojan War, this god fought the river-god Scamander [SKAH-man-der]. He once arrived to Olympus on the back of a mule after Dionysus [die-oh-NIE-sus] got him drunk. This god is credited with designing the sandal of Hermes and the aegis of Athena. His palace was on Lemnos, where he landed after he was struck from Olympus. That fall made him a cripple, and he was often cheated on by his beautiful wife Aphrodite. Name this Greek god of smithing, volcanoes, and fire.

Hephaestus (accept Vulcan until "Greek")



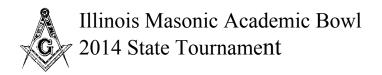
## **Question #21: Science – Biology**

10 points per part

The	primary classes in this phylum [FIE-lum] are	
ade	nophorea [ah-deh-noe-FOR-ee-uh] and secernentea	
[sel	n-ser-NEN-tee-uh].	
	Name this phylum often referred to as roundworms.	nematodes (or nematoda)
1		
	The fate of every somatic cell in this transparent	C(aenorhabditis) elegans
2	nematode species has been mapped. Sydney Brenner	
	encouraged its use as a model organism.	
	The spiralis [spih-RAL-is] species of roundworms is	trichinosis (or trichinellosis or
3	responsible for this disease usually caused by eating	<u>trichiniasis</u> )
	undercooked pork. Make sure you name the disease.	

## **Question #22: Science – Biology**

The	ese can cause evolution or cancer.	
1	Name this change in genetic material affecting a nucleotide sequence.	mutations (accept more specific answers)
2	Name the type of insertion or deletion mutation in which the number of genes gained or lost is not divisible by three, causing the grouping of genes into codons [KOE-dons] to change.	reading <u>frameshift</u> mutation (or <u>framing</u> error)
3	This DNA sequence, nicknamed jumping genes and discovered by Barbara McClintock, can cause mutations by moving to a different location in a gene sequence.	transposon (or transposable element or retrotransposon)



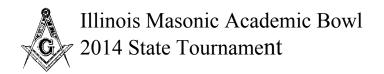
#### **Question #23: Literature – U.S. Literature**

10 points per part

In t	his play, the protagonist was promoted to garbage truck	
dri	ver after filing a complaint about how African	
An	nericans never received such promotions.	
	Name this play in which Cory is convinced to attend his	<u>Fences</u>
1	father's funeral after singing his father's song about Old	
	Blue.	
	Fences was written by this playwright of the ten-play	August Wilson (accept Frederick
2	Pittsburgh Cycle, which included Fences and The Piano	August <u>Kittel</u> )
	Lesson.	
	After Cory changes his mind about attending the	<u>trumpet</u>
3	funeral, Uncle Gabe pulled out this instrument to signal	
	to St. Peter to let Troy in.	

#### **Question #24: Literature – U.S. Literature**

	ne of her poetry is found in the collection "Poems on rious Subjects, Religious and Moral."	
4	Name this colonial poet who described peace as a	Phyllis Wheatley
1	woman "divinely fair, olive and laurel binding her golden hair" in "Liberty and Peace."	
	In one poem, Phyllis Wheatley wrote that this general	General George Washington (the
2	deserved "a crown, a mansion, and a throne that shine."	poem is "To His Excellency
		General Washington")
	In "To the King's Most Excellent Majesty," Wheatley	<u>repeal</u> of the <u>Stamp Act</u> (accept
3	praised King George the Third for assenting to this	equivalents, but an answer of
	legislation, which was paired with the Declaratory Act.	"Stamp Act" is wrong)



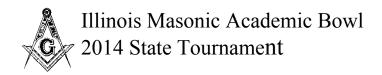
## **Question #25: Mathematics – Analytical Geometry**

10 points per part

	s operation starts with two vectors and gives a vector as	
a re	esult.	
1	Name this type of product in three dimensions whose result has a magnitude equal to the product of the magnitudes of the original vectors times the sine of the angle between them.	<pre>cross product (prompt on "vector product")</pre>
2	This product combines the cross product with the dot product. It is used to find the volume of a parallelepiped [pa-ruh-le-luh-PIE-ped].	(scalar or mixed) <u>triple</u> product (accept <u>box</u> product)
3	Find the cross product of the vector $(1,1,0)$ with the vector $(0,1,1)$ .	( <u>1,-1,1</u> )

## **Question #26: Mathematics – Analytical Geometry**

	s name is given to a triangle that has three congruent es and three congruent angles.	
1	Give this adjective that means the same thing as regular when applied to a triangle.	equilateral (or equiangular)
2	If two of the vertices of an equilateral triangle are at (0,0) and (2,0), and the other vertex is in the first quadrant, give the coordinates of the other vertex.	(1, root 3) (the y-coordinate can be given as square root of 3 or radical 3 or equivalents)
3	Give the final coordinates of the point that starts at (2,0) if that triangle is rotated 135 degrees counterclockwise around the origin.	( <u>negative root 2</u> , root 2) (root 2 is the same thing as square root of 2 or radical 2)



#### **Question #27: Social Studies – Economics**

10 points per part

In c	ne work, this person claimed that classical economics	
cou	ld not solve real-world problems, since its assumptions	
are	rarely satisfied.	
	Name this British economist and author of <i>The General</i>	John Maynard <b>Keynes</b>
1	Theory of Employment, Interest, and Money.	
	In The Economic Consequences of the Peace, Keynes	1919 Treaty of <b>Versailles</b>
2	[kayns] railed against the economic sanctions set down	
	by this treaty.	
	Keynes' first economic text was focused on the	<u>India</u>
3	"Finance and Currency" of this region, where he had	
	previously worked as a civil servant.	

#### **Question #28: Social Studies – Economics**

		re perme per part
Aco	cording to the economist who coined the term, this	
pra	ctice leads to a society characterized by wasted time	
and	money.	
	Name this practice of consumers to purchase goods and	conspicuous consumption (accept
1	services in order to "show off." Laggards attempt to	<b>conspicuous leisure</b> , but do not
	catch up through "pecuniary emulation."	mention this answer if not given)
	Conspicuous consumption was coined by this	Thorstein <b>Veblen</b>
2	Norwegian American whose namesake goods have an	
	upward-sloping demand curve once the price reaches a	
	level that makes it a status symbol.	
	Veblen wrote a book about "The Theory of" this class,	<u>leisure</u>
2	in which he railed against conspicuous consumption	
3	and called this concept a "nonproductive consumption	
	of time."	

#### Round # 6 5<sup>th</sup> Section Toss-up Questions

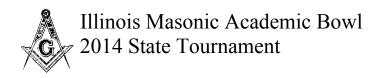
## **Question #29: Mathematics – Math Concepts**

10 points

The number of these structures of a given size is given by	<u>tree</u> s
the formula n raised to the n-2 power, which is named for	
Arthur Cayley. An attempt to build a minimal one of these	
objects is a problem named for Jakob Steiner. Binary heaps	
use a binary type of this structure, in which nodes beyond	
the first one are classified as left or right when they are	
added. Each pair of vertices in these structures are	
connected by exactly one simple path. Name these types of	
undirected bipartite graphs.	

#### **Question #30: Literature – British Literature**

	i o ponite
In one novel, this author wrote of an astrologer who	Sir Walter <u>Scott</u>
predicted hazards befalling a newborn on his fifth, tenth,	
and twenty-first birthdays, with the first being his	
kidnapping while riding with a revenue officer. He also	
wrote of an outlaw whose son later ran a sword through	
him; that son was kidnapped by Meg Murdockson. This	
author of Guy Mannering and The Heart of Midlothian	
wrote about the son of Cedric the Saxon and his disinherited	
son. Name this Scottish author of <i>Ivanhoe</i> .	



#### Round # 6 5<sup>th</sup> Section Toss-up Questions

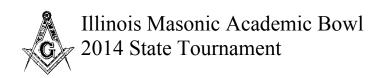
## **Question #31: Science – Biology**

10 points

These fibers often are attracted to netrin [NET-trin]. These	<u>axon</u> s
are packed tightly but not able to touch each other because	
of cytoplasm inside a Remak [ray-MAHK] bundle. This part	
of a cell extends from its namesake hillock, and these are	
often surrounded by a type of cell that produces electrically	
insulating material. Those surrounding cells are Schwann	
cells, and the insulator is myelin [MIE-uh-lin]. Name these	
nerve fibers that conduct electricity away from a neuron.	
·	

## **Question #32: Social Studies – World History**

	. c p cc
Following this event, one leader departed for home with the	Second Crusade (prompt on
aid of Roger of Sicily, while another left for Constantinople	"Crusade"s)
to plot against the Italian leader. During this, Prince	
Raymond suggested an attack on Antioch in response to the	
massacre at Edessa [eh-des-sah]. Backed by the Papal Bull	
Quantum praedecessores [pray-deh-SEH-soh-res] issued by	
Pope Eugenus III, it was led by Louis VII and Conrad III,	
the latter after being convinced by St. Bernard of Clairvaux	
[klar-voe]. Name this failed attempt to take Damascus in the	
12th century.	



# Round # 6 Extra Section Toss-up Questions

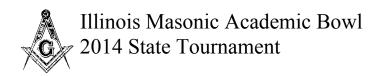
## Extra Question #1: Fine Arts - Classical/Opera

10 points

The title character in this opera sings "Pari siamo" after a	<u>Rigoletto</u>	
discussion with the assassin Sparafucile		
[spa-rah-foo-CHEE-lay]. One of this opera's main		
characters, a duke, advises to avoid fidelity like the plague		
in the aria "Questa o quella." That duke later has a		
relationship with the title character's daughter Gilda and		
sings the aria "La donna e mobile [MOE-bee-lay]." Name		
this work in which a curse is placed on the duke and the title		
character, a jester, an opera by Giuseppe Verdi.		

#### Extra Question #2: Literature – British Literature

This character sought to purchase the Carfax estate near	Count <b>Dracula</b>
London, and he later took control of Bersicker. Arriving in	
England near Whitby on the <i>Demeter</i> [deh-MEE-ter], he	
later fled via the <i>Czarina Catherine</i> , which he forced up the	
Danube. When a guest asked to leave, he opened the door to	
a pack of wolves waiting outside. Name this creation of	
Bram Stoker who was a vampire.	



# Round # 6 Extra Section Toss-up Questions

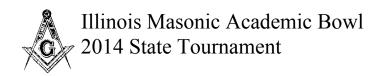
#### Extra Question #3: Science - Earth Science

10 points

These are quantified by Doodson Numbers, and these do not	<u>Tide</u> s
exist at amphidromic [am-fih-DROE-mik] points.	
Depending on location, these can be diurnal [die-UR-nul],	
semi-diurnal, or mixed. When these are at their largest, they	
are classified as spring, and the location where these are	
largest is the Bay of Fundy. The spring type of this occurs	
twice a month, as does the low type, which is called neap.	
Name these ocean phenomena in which the water level rises	
and falls during the course of a day.	

#### Extra Question #4: Social Studies – World History

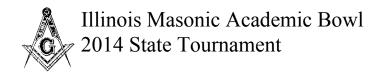
		i o ponito
Expelled from the Commonwealth following two coups led	Republic of Fiji	
by Sitiveni Rabuka, George Speight led another coup here		
in 2000. The prohibition of land sales and taxes of produce		
in lieu of cash were implemented here by Sir Arthur		
Gordon. The Colonial Sugar Refining Company imported		
Indian laborers to this nation, whose descendants make up		
about one-third of the population. Name this Polynesian		
nation with capital Suva.		



# Round # 6 Extra Section Toss-up Questions

## Extra Question #5: Mathematics – Math Concepts

Soon after Lobachevsky [loe-bah-CHEV-skee] developed	Bernhard Riemann
hyperbolic geometry, this person developed elliptic	
geometry. This person's namesake geometry is differential,	
allowing for the use of his namesake metric and manifolds.	
This person's paper "On the Number of Primes Less Than a	
Given Magnitude" introduced a function named his zeta	
function. Name this German mathematician whose name is	
used for the integral approximation method that uses	
rectangles.	



## Round # 6 Extra Section Teamwork Questions

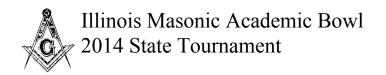
## Extra Question #6: Mathematics – Probability

10 points per part

	thods to generate the pseudo- type of these numbers lude Blum Blum Shub.	
1	Name these numbers that are selected in a way such that each number has an equal probability of being selected each time a selection is made.	random number(s)
2	If two digits are selected at random, what is the probability that they are both fives?	<u>1/100</u> (or 0 <u>.01</u> )
3	If a random letter and a random digit are selected, what is the probability that the letter is either A or B, and the digit is odd?	1/26

#### Extra Question #7: Mathematics – Probability

The	type of process named for this person has a future that	
ma	y be influenced by its present state but cannot be	
infl	uenced by its past state.	
	Name this Russian mathematician whose chains are	Andrey Markov (or Markov
1	used to give transitions between one state and the next.	<u>chains</u> )
	Markov chains are used in these processes, also called	stochastic process(es)
2	random processes, which follow a random variable over	
	time.	
	In the transition matrix for a Markov chain, the numbers	<u>1</u>
3	in a given row must add to this number in order to	
	account for the sum of all probabilities.	



## Round # 6 Extra Section Teamwork Questions

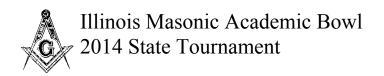
## Extra Question #8: Social Studies - U.S. History

10 points per part

Wh	ile testifying before the Senate Committee on Foreign	
Rel	ations, he was unable to come up with a single name of a	
"ca	rd-carrying Communist."	
	Name this Wisconsin senator who was later censored	Joseph Raymond McCarthy
1	for conduct "contrary to Senate traditions."	
	The ultimate downfall for McCarthy came during a 36-	United States <b>Army</b>
2	day hearing on charges of subversion by members of	
	this Armed Forces branch.	
	During the hearing, this special counsel for the Army	Joseph Nye Welch
3	asked McCarthy, "Have you no sense of decency sir, at	
	long last? Have you left no sense of decency?"	

## Extra Question #9: Social Studies – U.S. History

	s federal organization hears petitions regarding working ditions and wages.	
	Name this agency which investigates retaliations	National Labor Relations Board
1	against protected concerted activity.	(accept NLRB)
2	The NLRB was established by this act, also called the National Labor Relations Act. It prohibited employers from forming their own unions, but initially excepted agricultural and domestic laborers.	Wagner Act
3	Per the Taft-Hartley Act, 60 days' notice had to be given before unions could do this. If it involved federal employees, an 80-day injunction could be sought.	strike (accept word forms)



#### Round # 7 1<sup>st</sup> Section Toss-up Questions

#### **Question #1: Literature – U.S. Literature**

10 points

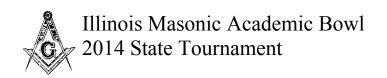
The protagonist of this collection routinely walked along	Winesburg, Ohio
Trunion [TRUN-yun] Pike on the outskirts of the central	
town. Upon leaving on a train, that character thought of	
Turk Smollett and the lamp lighter Butch Wheeler. In this	
anthology, one character fell asleep while trying to grasp	
something a teacher was trying to tell him. That teacher was	
Kate Swift, the object of George Willard's affection. Name	
this story collection centering on a small midwestern town	
written by Sherwood Anderson.	

#### **Question #2: Mathematics – Math Concepts**

10 points

The first constant named for this shape equals pi times Gauss' constant. This shape is the inverse curve of a hyperbola. One form of the equation for this shape is the square of the sum of the squares of the coordinates equals the difference of the squares of the coordinates. Its equation is easier to state in polar coordinates, where r squared is proportional to the cosine of two theta. Name this shape sometimes named for Bernoulli [ber-NOO-lee] that is used to represent infinity and looks like a figure eight.

#### lemniscate of Bernoulli



#### Round # 7 1<sup>st</sup> Section Toss-up Questions

#### **Question #3: Miscellaneous – Sports**

10 points

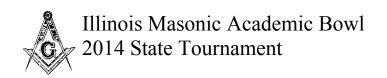
The original trophy given to the winners of this event was named for Jules Rimet [ree-may]. Controversial events at this gathering have included the "Disgrace of Gijon [hee-HONE]" match and Harald Schumacher's hip-check to Patrick Battiston's face. Marco Materazzi [mah-teh-RAH-zee] was headbutted by Zinedine Zidane [zahn-deen zee-don] in the 2006 Final of this event. Allegations of bribery have surrounded the votes that awarded a future iteration to Qatar [KAH-tur]. Name this quadrennial soccer tournament that crowns a global champion.

#### **Question #4: Science – Biology**

10 points

[Note to moderator: When reading this question, just spell out aaRS, TPsiC, and DHU.] Amino acids are connected to this molecule by a synthetase [SIN-thuh-tase] made using an aaRS gene, and this molecule is called charged when the amino acid is attached. Robert Holley mapped the example of this molecule that binds to alanine [A-luh-neen]. A mapping of these molecules generally includes a TPsiC arm, DHU arm, and anticodon [an-tie-KOE-don] as part of its cloverleaf structure. Name these molecules that move amino acids to ribosomes [RIE-boe-soems], a type of ribonucleic [rie-boe-new-KLAY-ik] acid.

<u>transfer</u> RNA (accept <u>tRNA</u> or <u>transfer ribonucleic acid</u>, prompt on "RNA" or "t" or "ribonucleic acid")



#### Round # 7 1<sup>st</sup> Section Toss-up Questions

## **Question #5: Social Studies – World History**

10 points

Aristodemus [ah-ris-toe-DEE-mus] led a Greek force that repelled an invasion at Cumae [KOO-mae] from these people. The Greeks later chose to abandon Corsica after fighting them at Alalia [ah-lah-LEE-uh]. Also called the Rasenna, the "Linen Book of Zagreb" was written in their language. Defeated at the Battle of Silva Arsia, Lucius Junius Brutus drove out their last king, Tarquinus Superbus, in 509 BC. Name these predecessors to the Romans as the predominant Italic people.

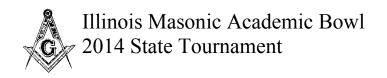
Etruscans (accept Etrusci, Tusci, Tyrsenoi, Tyrrhenoi, accept "Rasenna" before mentioned)

#### **Question #6: Literature – British Literature**

10 points

The speaker in this poem found a singer of godly hymns
made in the wood who could wash away blood. A woman
with red lips, golden locks, and skin as white as leprosy won
the title character in a game of dice against Death.
Afterwards, the speaker saw two hundred companions drop
one by one. In this poem, he tells his story to the Wedding-
Guest. The turning point in this poem was the shooting of an
albatross. Name this poem about a sailor written by Samuel
Coleridge.

#### "Rime of the Ancient Mariner"



## **Question #7: Science – Physics**

10 points per part

	s concept is closely related to invariance because it lies to features that are unchanged by transformations.	
1	Name this concept whose super type pairs up particles.	super <u>symmetry</u>
2	This type of symmetry applies to factors that do not change when a system goes through the equivalent of a three-dimensional mirror.	parity (or p-symmetry)
3	A violation of charge parity symmetry was found in the decay of kaons [KAY-ons], which are an example of these particles consisting of a quark with an antiquark.	<u>meson</u> s

## **Question #8: Science – Physics**

	s form of Einstein's theory of relativity was developed ore the other one.	
1	Name this theory of relativity which assumes non-accelerating frames of reference.	special relativity
2	The mathematical transformations of time and space under special relativity are named for this Dutch scientist.	Hendrik <b>Lorentz</b> (transformation)
3	Shortly after Einstein developed special relativity theory, this former teacher of his demonstrated how to picture them in his now namesake four dimensional spacetime.	Hermann Minkowski (spacetime)

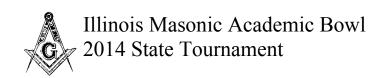
## **Question #9: Social Studies – Geography**

10 points per part

The	e Cape York Peninsula forms the northern tip of this e.	
1	Name this Australian state, home to the Sunshine Coast. This state is east of the Northern Territory.	Queensland
2	This capital of Queensland is linked to Sydney via the Pacific Highway and is near Moreton Bay.	<u>Brisbane</u>
3	This second-most populous city of Queensland lying on the border with New South Wales recieved its moniker from real estate investors.	Gold Coast

## **Question #10: Social Studies – Geography**

	Satpura and Vindhya [VIN-die-uh] ranges separate it n the Gangetic [gahn-JEE-tik] Plain.	
1	Name this large plateau made primarly of basalt. Its Golconda region is a site of diamond and gold mining.	<b>Deccan</b> Plateau
2	The Deccan [DEH-kun] Plateau makes up most of the geographical area of this Asian nation.	<u>India</u>
3	These two mountain ranges run along either side of the Deccan. Both run as far south as Tamil Nadu province.	Western and Eastern Ghats (accept Sahyadri and Purva Ghat)



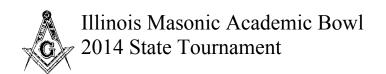
## **Question #11: Mathematics – Probability**

10 points per part

_		, , ,
	argument over a dice game led to the early development probability theory in the 17 <sup>th</sup> century.	
1	The dispute arose over the probability of whether or not you would get a double six in 24 tries rolling two dice at a time. This problem can be solved by raising what number to the 24 <sup>th</sup> power?	
2	This person wrote the first probability text, <i>De ratiociniis</i> [RAY-show-sih-nee-is] <i>in ludo aleae</i> [A-lee-ay]. This person also devised the theory that every point reached by light can be treated as the source of a spherical wave.	Christiaan <u>Huygens</u>
3	In 1812, this Frenchmen contributed to the development of probability theory by popularizing work by Bayes on conditional probability and work by de Moivre [mov] on binomial distributions. His work in probability led to the development of his namesake transforms used in calculus that are similar to Fourier [fur-ee-ay] transforms.	

## **Question #12: Mathematics – Probability**

Th	is person wrote "On certain limit theorems of the theory	
of	probability" with Mark Kac, and this person wrote	
"R	andom Graphs" with Alfred Renyi.	
	Name this Hungarian famous for writing lots of papers	Paul Erdos
1	with lots of collaborators. His life was the subject of the	
	book The Man Who Loved Only Numbers.	
	The Erdos-Renyi work looked at how many ways you	<u>3</u>
1	could get a particular graph. If you have three	
2	distinguishable vertices, how many ways can you get a	
	simple graph with two edges?	
	If loops are allowed on the graph but not multiple	<u>15</u>
3	edges, how many ways can you have three	
	distinguishable vertices with two edges?	



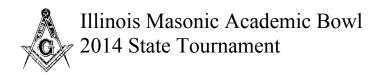
#### **Question #13: Literature – World Literature**

10 points per part

	e central family in this novel drove 600 kilometers across veld to escape the revolution.	
	Name this novel in which the Smales family took	July's People
1	shelter with their servant and his relatives after	
	escaping.	
	This Nobel Laureate and author of <i>July's People</i> wrote	Nadine <b>Gordimer</b>
2	of a pig-iron tycoon who left behind 400 acres of land	
	in The Conservationist.	
	The action of <i>July's People</i> took place against the	Republic of South Africa
3	backdrop of revolution against apartheid in this	
	country.	

#### **Question #14: Literature – World Literature**

	his tale, a youth adopted the philosophy of Arthur openhauer.	
1	Name this novel in which Noburu is number three within a group of top students which poisons the title character for merely rebuking his stepson for utilizing a peephole.	The Sailor Who Fell from Grace with the Sea (accept Goko no eiko)
2	This author of <i>The Sailor Who Fell from Grace with the Sea</i> wrote about a place of worship being set ablaze in <i>Temple of the Golden Pavilion</i> .	Yukio <u>Mishima</u> (accept Kimitake <u>Hiraoka</u> )
3	In one ritual in the novel, the schoolboys kill one of these animals to symbolize the emptiness of existence.	cat (accept kitten or other equivalents)



#### Round # 7 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Science – Chemistry**

10 points

One example of these compounds is produced by the oxidation of 2-butanol [BYOO-tah-nol], and a common test for these substances looks for the creation of iodoform [ie-oe-doe-FORM]. When humans produce too much of these chemicals because of too much fatty acid breakdown, their blood turns acidic, which is a diabetes symptom. The simplest example of this, used as nail polish remover, is acetone [A-suh-tone]. Name these carbonyls [KAHR-buh-nils] that are not aldehydes [AL-duh-hides] because the central carbon is bonded to two other carbons.

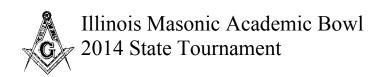
**ketones** (prompt on "carbonyl")

#### **Question #16: Social Studies – Economics**

10 points

Two fixed-weight variants of this measure are Laspeyres [las-pear] and Paasche [pa-sheh]. In the United States, the example of these focused on producers is called wholesale. To calculate real GDP, the United States utilizes the chain-weighted version of this, which accounts for changes in quantities. One common calculation of this involves a fixed bundle in the base period, and is referred to as the "consumer" one. Name this value which compares the cost of the same goods in different periods, often used as a measure of inflation.

consumer <u>price index</u> (accept <u>cost</u> <u>index</u> or C<u>PI</u>, prompt on "index" or "inflation", accept indices for index)



#### Round # 7 3<sup>rd</sup> Section Toss-up Questions

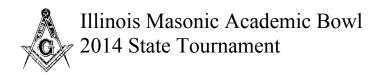
#### Question #17: Fine Arts - Classical/Opera

10 points

This composer wrote a piece based on an Arnold Bocklin painting and the song *Krisolov* based on "The Pied Piper." His 2<sup>nd</sup> piano concerto [kone-CHEER-toe] has a 2<sup>nd</sup> section opening with slow chords labeled "Adagio sostenuto [ah-DAH-jyo soes-teh-NOO-toe] – Più animato", and he made cuts to his 3<sup>rd</sup> piano concerto to make it easier to play. The influence of Rimsky-Korsakov can be found in this composer's *Symphonic Dances*. Name this composer who wrote 24 variations of the 24<sup>th</sup> and final caprice [kuh-PREES] in his *Rhapsody on a Theme of Paganini*.

#### Question #18: Social Studies – U.S. History

Black Hawk War



#### Round # 7 3<sup>rd</sup> Section Toss-up Questions

#### **Question #19: Science – Astronomy**

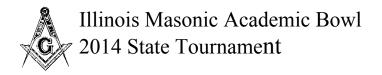
10 points

This term credited to Hipparchus [hih-PAHR-kus] is still used even though his reason for using it was incorrect. Hipparchus classified objects into six classes, while one of the two modern measurements of this quantity is based on comparisons to the star Vega. To keep values on the y-axis between negative ten and positive twenty on a Hertzsprung-Russell diagram, astronomers use this quantity instead of luminosity. Name this quantity whose apparent and absolute values are measures of brightness.

magnitude (accept apparent magnitude or absolute magnitude)

#### **Question #20: Literature – World Literature**

In this drama, one character claims to conquer all, though he	Peer Gynt
does not fight. The Great Boyg admitted defeat to a man	
backed by women. That character attempted to talk up his	
slave dealing in America and how he saved himself at the	
expense of a cook in order to escape the ladle of the Button	
Moulder, but Solveig [SOOL-vay] claimed that the title	
character made life beautiful. This work opens with a	
description of a reindeer hunt. Name this play about a	
Norwegian farmer by Henrik Ibsen that inspired a musical	
suite penned by Edvard Grieg.	



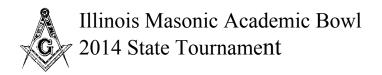
#### **Question #21: Fine Arts – Art History**

10 points per part

Thi	s artist led the Vienna Secession movement.	
1	Name this artist who used gold leaf in many of his works, such as <i>The Kiss</i> and his first portrait of Adele Bloch-Bauer.	Gustav <u>Klimt</u>
2	The Secession Building in Vienna has a large frieze painted by Klimt to honor this famous person.	Ludwig van <u>Beethoven</u>
3	Klimt created three mosaics that form a frieze in a mansion in Brussels built for this person. The mansion is sometimes called a palace.	Adolphe Stoclet

## **Question #22: Fine Arts – Art History**

	s artists's Not to Be Reproduced shows the back of a	
mai	n's head twice, once as though it is somehow being	
refl	ected in a mirror.	
	Name this Belgian surrealist who often included	Rene Magritte
1	bowler hats in his works.	
	These words appear at the bottom of Magritte's	"Ceci n'est pas une pipe" (accept
2	painting <i>The Treachery of Images</i> . Feel free to give the	"This is not a pipe" or
	original French or an English translation.	equivalents)
	Magritte's <i>The Portrait</i> shows one of these in the	eye
3	middle of a slice of ham.	



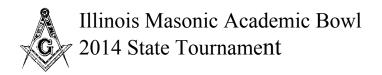
#### Question #23: Social Studies - U.S. History

10 points per part

Thi	s incident was sparked by an order given by	
Coı	nmander Salisbury Humphreys.	
	Name this controversy surrounding the alleged deserters	<b>Chesapeake</b> -Leopard (Affair or
1	William Ware, Daniel Martin, and John Strachan, who	Incident)
	had actually been impressed into service.	
	In the aftermath of the affair, Thomas Jefferson signed	Embargo Act of 1807
2	this act, which closed down all exports. It was later	
	repealed via the Non-Intercourse Act.	
	In 1810, a bill offering to resume trade with Great	Nathaniel Macon (accept Macon's
2	Britain or France contingent on the reversal of trade	Bill Number 2)
3	restrictions was named for this head of the House	
	Foreign Relations Committee.	

#### Question #24: Social Studies – U.S. History

	n Behan tried to prevent this incident from happening, he was pushed aside by the local marshal.	
1	Name this incident whose perpetrators were exonerated by Judge Wells Spicer for their actions on Fremont Street.	Gunfight at the OK Corral (accept equivalents)
2	The Gunfight at the OK Corral took place in this state's city of Tombstone.	<u>Arizona</u>
3	This local marshal brought in his brothers Wyatt and Morgan, as well as Doc Holliday, for the Gunfight.	Virgil Earp (prompt on "Earp")



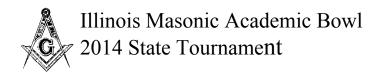
## **Question #25: Science – Chemistry**

10 points per part

	e definition of a salt is a compound in which the rogen atom of an acid is replaced by a metal.	
1	Give the chemical formula of table salt.	sodium chloride (or NaCl)
2	Road salt is often used to prevent ice from forming by taking advantage of this colligative property of water.	<u>freezing-point depression</u> (accept equivalent answers)
3	This is the mineral name of sodium chloride.	<u>halite</u>

## **Question #26: Science – Chemistry**

The	primary types of these molecules are similar to alkanes,	
but	one of the hydrogen atoms has been replaced by an	
oxy	gen atom and a hydrogen atom.	
	Name this class of compounds that includes ethanol.	primary <u>alcohol</u> s
1		
	Also called wood alchohol, this is the name of the	methanol (or methyl alcohol, do
2	alcohol with the simplest molecular structure.	not accept "menthol")
	Also called rubbing alcohol, this is the IUPAC name of	<u>isopropyl</u> alcohol (or <u>propan-2-ol</u> )
3	the secondary alcohol with the simplest molecular	
	structure.	



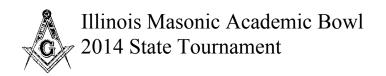
#### Question #27: Literature - U.S. Literature

10 points per part

In	this drama, an alcoholic choir leader advised a newly-	
de	ad mother that life is a time of ignorance, bliss, and	
fo	ly.	
	Name this play in which George Gibbs fell for a next-	Our Town
1	door neighbor and passed up going to agricultural	
	school to marry her.	
	This author of <i>The Bridge of San Luis Rey</i> wrote <i>Our</i>	Thornton Niven Wilder
2	Town.	
	Our Town is primarily set in this fictional New	Grover's Corners
3	Hampshire locale, across the tracks from Polish Town.	

#### **Question #28: Literature – U.S. Literature**

	his story, one elder is anxious to visit her connections in nnessee, and adamant about not travelling to Florida.	
1	Name this story in which the grandmother tried in vain to beg the Misfit from shooting her but ended up with three shots in the chest.	"A Good Man is Hard to Find"
2	This author of "A Good Man is Hard to Find" wrote about preacher Hazel Motes in "Wise Blood."	Mary Flannery <u>O'Connor</u>
3	The central family in "A Good Man is Hard to Find" was travelling from this state. John Wesley called it "a lousy state," while also calling Tennessee a "hillbilly dumping ground."	Georgia



#### Round # 7 5<sup>th</sup> Section Toss-up Questions

#### **Question #29: Science – Physics**

10 points

The Gargamelle [GAHR-guh-mel] bubble chamber at	<u>neutrino</u> s	
CERN [sern] that was used to make early quark		
measurements was designed to detect these particles. It gave		
evidence of these particles during the 1970s by finding		
evidence of interactions involving W and Z bosons in the		
electroweak force. The oscillation of these particles and the		
discovery that they have mass explains why we detect fewer		
of these from the Sun than were expected earlier. Name		
these leptons, each type of which correlates with one of the		
other leptons.		

## **Question #30: Social Studies – World History**

10 points

Following his refusal to ratify the Treaty of Regensburg [RAY-gens-burg], the Hapsburgs appealed for this person's excommunication. The target of a conspiracy led by the Marquis [mahr-kee] of Cinq-Mars [seenk-mahrs], this founder of the Academie Francaise [frahn-saes] rose to Secretary of State during a crisis in the Valtellina [val-tay-LEE-nah] region of Italy. This leader of the siege at La Rochelle rose to prominence during the regency of Marie de Medici [MEH-dee-chee]. Name this religious leader, the French Prime Minister under Louis the Thirteenth.

Cardinal <u>Richelieu</u> (accept <u>Duke</u> <u>Richelieu</u> or Armand-Jean du <u>Plessis</u>, prompt on "Red Eminence" or "L'eminence Rouge")

#### Round # 7 5<sup>th</sup> Section Toss-up Questions

## **Question #31: Mathematics – Math Concepts**

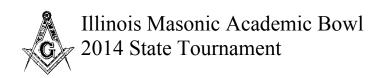
10 points

An efficient ellipsoid method for solving these problems was introduced by Narendra Karmarkar. An older method developed by George Dantzig to solve these problems using pivot operations inside a tableau [ta-BLOE] is the simplex algorithm. If there are only two variables, these problems can be solved by drawing a polygon to represent the feasible region from the constraints. Name these optimization problems in which the goal is to maximize or minimize the value of a first-degree objective function.

<u>linear programming</u> (accept <u>LP</u>, prompt on linear "optimization")

#### **Question #32: Literature – British Literature**

In one work of criticism, this writer used the backdrop of a	John <b><u>Dryden</u></b>
naval battle between the English and Dutch for a	
discussion of literature. He utilized Neander as a	
mouthpiece for his own opinions in Of Dramatic Poesy.	
He wrote of a monarch who chose a man "mature in	
dullness from his tender years" and "stands comfirm'd in	
full stupidity." In one satire, this writer compared King	
Charles II to David, and the Duke of Monmouth and the	
Earl of Shaftesbury to the title characters. His longest	
poem, describing his conversion to Catholicism, is <i>The</i>	
Hind and the Panther. Name the author of "MacFlecknoe"	
and Absalom and Achitophel.	
•	



# Round # 7 Extra Section Toss-up Questions

#### Extra Question #1: Social Studies – U.S. History

10 points

Philip Amadas and Arthur Barlowe returned to England from this site with Manteo and Wanchese [wahn-chay-say]. Its early leaders included Sir Richard Grenville and Ralph Lane. John White founded a second iteration of a colony here; when White returned here in 1590, he found the word CROATOAN [KROE-uh-toe-un] carved into a tree. Founded by Sir Walter Raleigh, name this island off the coast of North Carolina, home to the Lost Colony.

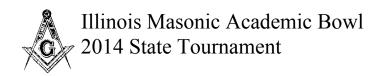
Roanoke Island (prompt on "North Carolina" until "Richard", prompt on "Lost Colony")

#### Extra Question #2: Science – Physics

10 points

The temperature named for this person is similar to the Unruh [un-ruh] Temperature, though it is based on gravitational field strength rather than acceleration. He worked closely with Roger Penrose, applying Penrose's work on singularities to the state of the universe before the Big Bang. This person's later work led to predictions that Black Holes would eventually use up their energy and vanish because they emit his namesake radiation. Name this scientist who suffers from ALS and wrote *A Brief History of Time*.

#### Stephen **Hawking**



# Round # 7 Extra Section Toss-up Questions

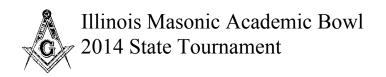
#### Extra Question #3: Fine Arts – Art History

10 points

A memorial to this architect says in Latin "If you seek his	Sir Christopher Wren
memorial, look about you." One of his buildings is called a	
hospital, though it is a retirement home for veterans located	
in Chelsea. This architect of Saint Clement Danes designed	
another church that is on top of Ludgate Hill. Name this	
architect of the Royal Observatory at Greenwich	
[GREN-ich] who, after the Great Fire of London, oversaw	
the construction of many churches, including Saint Paul's.	

## Extra Question #4: Mathematics – Math Concepts

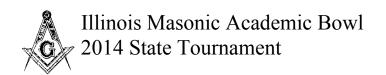
One of these things is classified as homogeneous if it does	(ordinary) differential equations
not contain any functions in terms of x that are not	
multiplied by other functions, which means that it has no	
constant terms. The ordinary types of these use only one	
independent variable, and some ordinary types are initial	
value problems. Solutions to common types of these are	
exponential or logistic functions, and the simplest examples	
can be solved using the separation of variables. Name this	
type of equation that relates a function to its rate of change.	



# Round # 7 Extra Section Toss-up Questions

### Extra Question #5: Literature – U.S. Literature

One actor in this story draws on the horrors of World War	<u>J. B.</u>
Two in decrying the punishment of people "for walking	
round the world in the wrong skin." One messenger in this	
drama frequently proclaims that "I only am escaped alone to	
tell thee," and also claims that witnesses also suffer. The	
protagonist of this play learns of his son being shot, two	
other children dying in a car wreck, and a fourth being	
raped. Name this allegorical play with parallels to the story	
of Job [jobe], by Archibald MacLeish.	



# Round # 7 Extra Section Teamwork Questions

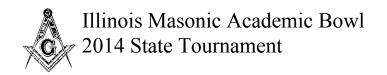
## Extra Question #6: Mathematics – Geometry

10 points per part

The	ere are several ways to prove two triangles congruent.	
	There are six pieces of information to know about a	<u>3</u>
1	triangle—three side lengths and three angle measures.	
-	To prove that two triangles are congruent, what is the	
	least number of corresponding congruencies necessary?	
	This name is given to the side-side-angle case, which is	ambiguous case
2	when you have three corresponding congruencies and	
<b>Z</b>	still have not proven that the two triangles are	
	congruent.	
	If there are two different triangles where you know the	180 degrees (or <b>pi</b> radians)
1	congruent measures of side b, side c, and angle B, then	
3	this is the sum of the two measures of angle C in the	
	two different triangles.	

## Extra Question #7: Mathematics - Geometry

	triangle the three of these segments meet at the nocenter.	
1	Name this segment, used to measure height, that has one endpoint at a vertex and forms a right angle with the opposite side.	altitude
2	This is the area of a three four five right triangle. Ignore units.	<u>6</u>
3	This is the length of the altitude to the hypotenuse in a three four five right triangle. Ignore units.	<u>12/5</u> (or <u>2 2/5</u> or <u>2.4</u> )



# Round # 7 Extra Section Teamwork Questions

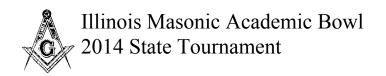
### Extra Question #8: Literature - U.S. Literature

10 points per part

In c	one poem, he "died blind and still by faith he trod."	
1	Name this figure who "led boldly with his big bass drum." While halting by the curb for prayer, he "saw his master through the flag-filled air."	General William <u>Booth</u>
2	This poet utilized the tune of "The Blood of the Lamb" in writing "General William Booth Enters into Heaven."	Vachel <u>Lindsay</u>
3	General William Booth earned his title as the founder of this charity organization.	Salvation Army

#### Extra Question #9: Literature – U.S. Literature

Th	e action of this play takes place in a small town on Labor	
Da	y. It opens with a meddling neighbor speaking to a	
vag	gabond in cowboy boots and a tee shirt.	
	Name this play in which Madge, the prettiest girl in	<u>Picnic</u>
1	town, is contrasted with her intellectual tomboyish	
1	sister Millie. In the end, Flo regretted not passing on	
	her wisdom to her elder daughter.	
	This author of <i>Picnic</i> wrote about a blizzard forcing a	William Motter <u>Inge</u>
2	group of passengers to stay at a restaurant overnight in	
	Bus Stop.	
	<i>Picnic</i> was set in a small town in this state. In one	Kansas
2	book, Alvin Dewey was the head of its Bureau of	
3	Investigation, which hunted Perry Smith and Dick	
	Hickock for the murder of the Clutter family.	



#### Round # 8 1<sup>st</sup> Section Toss-up Questions

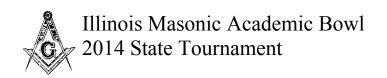
## **Question #1: Mathematics – Math Concepts**

10 points

Starting with a circle and fixed point P, this curve is the	limacon
locus of all points X so that PX is perpendicular to a tangent	
line of the circle, which means that this is the pedal	
[PEED-ul] curve of a circle. Similar to a hypocycloid	
[hie-poe-SIE-kloid], this can be generated by following a	
point inside one circle as that circle rolls around outside	
another circle. There are three forms this shape can take,	
one of which includes a loop and another one of which is a	
cardioid. Name this shape generated by the equation r	
equals c plus d sine theta.	

## **Question #2: Social Studies – U.S. History**

In the build-up to this battle, Grant's forces utilized the fleet	Battle of <b>Vicksburg</b>
of David Porter to move northeast, where his forces took	
Port Gibson and Grand Gulf before blocking the forces of	
Joseph Johnston. John Pemberton's forces retreated from	
Big Black River to the site of this battle, which culminated	
in isolating the western part of the Confederacy. Won a day	
after Gettysburg, name this siege fought on a key port in	
Mississippi.	



#### Round # 8 1<sup>st</sup> Section Toss-up Questions

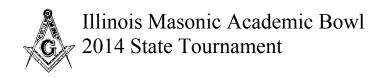
### **Question #3: Literature – British Literature**

10 points

A number of Cavalier poets, including Robert Herrick and	Ben Jonson
Richard Lovelace, were members of this writer's "tribe." In	
one work, he wrote of a five-thousand-pound wager	
concerning a trip to Constantinople. In that play, Brisk is	
undone when Macilente [mak-ih-lent] poisons a dog. This	
author of Every Man Out of His Humour also wrote a play	
in which Subtle poses as an astrologer and the title	
character. Name this author of <i>Volpone</i> and <i>The Alchemist</i> .	

## **Question #4: Science – Physics**

This person developed a device more complicated than a	1 <sup>st</sup> Baron Lord <u><b>Kelvin</b></u> (or William
Wheatstone bridge that is used for measuring small	Thomson)
resistances. The effect named for this person and James	
Joule [jool] explains the temperature change of a gas that	
expands without any heat transfer. He made improvements	
to the mirror galvanometer [gal-vah-NOM-ih-ter], which he	
used on his trans-Atlantic cable. Name this scientist whose	
work in thermodynamics led him to create an absolute	
temperature scale with its zero corresponding to absolute	
zero temperature.	



#### Round # 8 1<sup>st</sup> Section Toss-up Questions

#### **Question #5: Fine Arts – Art History**

10 points

This city's 23 Marina was the world's tallest residential building in the world until it was surpassed by this city's Princess Tower. This city, the current home of ocean liner *Queen Elizabeth 2*, is near an artificial archipelago [ahr-keh-PEL-uh-goe] in the shape of a world map and other groups of islands in the shape of palm trees. Taipei 101 was surpassed as the world's tallest skyscraper by this city's Burj Khalifa [burj kah-LEE-fah]. Name this city that lies on the Persian Gulf coast northeast of Abu Dhabi in the United Arab Emirates.

#### **Question #6: Literature – World Literature**

10 points

After reaching an agreement regarding financing for procuring timber from a local monastery, this character took to dancing. In a discussion with the narrator, he claimed that a man would burn in hell for letting a woman sleep alone. This man cited gifts of rose water and Christmas cookies as proof of a widow's interest in the narrator, his boss. Conned into marrying Madame Hortense, name this Grecian miner, the title character of a novel by Nikos Kazantzakis [NEE-koes kah-zahnt-ZAH-kis].

<u>Alexis</u> <u>Zorba</u> the Greek (accept either underlined part)

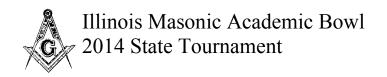
### **Question #7: Fine Arts – Classical/Opera**

10 points per part

	e first part of his 8 <sup>th</sup> symphony uses words from the nn "Veni Creator Spiritus."	
1	Name this composer who wrote "Symphony of a Thousand" in 1907.	Gustav Mahler
2	After completing "Symphony of a Thousand," Mahler wrote this song cycle using Hans Bethge's  [BETH-geh's] translations of Chinese poetry.	Das <u>Lied von der Erde</u> (or The <u>Song of the Earth</u> )
3	This is the longest of Mahler's symphonies and is the longest commonly performed orchestral music. Its "Midnight Song" uses words from Friedrich Nietzsche [NEE-schee].	3 <sup>rd</sup> symphony (or <i>Pastoral</i> )

### **Question #8: Fine Arts – Classical/Opera**

	s composer wrote <i>Variations on a Theme by Haydn</i> and <i>Ferman Requiem</i> .	
1	Name this composer whose "Good evening, good night" is known as his lullaby.	Johannes Brahms
2	Brahms wrote this piece for the University of Breslau after it awarded him an honorary doctorate.	Academic Festival Overture (or Akademische Festouverture)
3	Inspired by violinist Eduard Remenyi, Brahms also wrote this set of 21 pieces, completing the first ten in 1869 and the last eleven in 1880.	The <u>Hungarian Dances</u> (or <u>Ungarische Tanze</u> ) (prompt partial answers)



## **Question #9: Science – Biology**

10 points per part

	s substance is able to convert light into energy that is ful for living organism.	
1	Name this green pigment in plants and cyanobacteria [sie-a-noe-bak-TEHR-ee-uh].	chlorophyll
2	Along with heme [heem] in blood, chlorophyll is classified as this type of organic compound containing a ring of pyrrole [PEER-ole] rings.	porphyrin (prompt on "porphin")
3	While heme has iron at the center of its ring, chlorophyll has this other element at the center.	<u>Magnesium</u>

## **Question #10: Science – Biology**

The	ese are also known as flowering plants.	
1	Name these plants often contrasted with gymnosperms.	angiosperms
2	Classified based on their seed structure, this term usually refers to the angiosperms whose flower parts are multiplies of three.	<u>monocot</u> yledons
3	Monocots are generally classified as sessile [SEHS-il] because they lack these stalks connecting leaf blades to the stem.	<u>petiole</u> s

### **Question #11: Literature – British Literature**

10 points per part

Не	told his story through letters to Robert Walton.	
1	Name this Swiss doctor whose wife Elizabeth was murdered on their wedding night.	Victor Frankenstein (accept either)
2	This is Victor's brother, who was killed by the monster, who framed Justine Moritz for the crime.	William Frankenstein
3	The monster framed Justine by planting this object of William's in her pocket.	miniature (accept necklace)

#### **Question #12: Literature – British Literature**

Uni	ferth gave this hero his sword, but it failed spectacularly.	
1	Name this man who became King of the Geats [geets]. In his final battle, only Wiglaf stood by his side.	Beowulf
2	After this creature captured Aeschere [ash-HAR-eh], Beowulf ventured into a marsh to do battle with it. Beowulf slew it with a sword he found on the ground, but it melted as Beowulf came to the surface.	Grendel's mother (accept equivalents, do not accept "Grendel")
3	After a golden goblet was taken, one of these creatures ravaged Beowulf's kingdom. It delivered a fatal blow to Beowulf, but ended up dying from combat wounds as well.	dragon

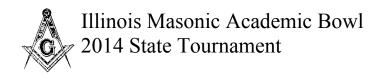
### **Question #13: Mathematics – Geometry**

10 points per part

par	his type of polyhedron, at most two of the faces are not allelograms. Commonly, at most two of the faces are not rangles.	
1	Name these shapes in which two opposite faces are congruent polygons.	<u>prism</u> s
2	This is the total number of faces of a pentagonal [pen-TAG-uh-nul] prism.	7
3	This is the volume of a triangular prism in which each edge is length one.	<u>root 3 over 4</u> (or <u>one-fourth root</u> <u>3</u> or <u>radical 3 over 4</u> or equivalents)

## **Question #14: Mathematics – Geometry**

Naı	ne these parts of a circle.	
1	This is a part of a circle bounded by two radii and the arc of the circle between them.	circular <u>sector</u>
2	If you connect the ends of the radii used to bound a sector, it breaks the sector up into a triangle and this region between a chord and an arc.	circular segment
3	If a circle has an area of 36, this is the area of a sector with a central angle of 120 degrees. Ignore units.	12



#### Round # 8 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Science – Astronomy**

10 points

A new example of one of these objects confirmed in 2013 is named 2011 QF99, though that object probably spent more time as a centaur than as one of these. That confirmation came two years after Martin Connors announced the discovery of another example of one of these, 2010 TK7, an object which is also an asteroid. Saturn has two moons that each have objects of this type associated with them. Name these objects found at Lagrangian [lah-GRAHN-jee-un] points that share an orbital path with a larger object.

trojans (or trojan asteroid, accept Lagrangian object before it is mentioned, prompt centaur before it is mentioned, prompt "Lagrangian")

#### Question #16: Social Studies – U.S. History

10 points

The Annapolis Convention was convened to revise this document. One provision allowed for Canada's immediate entry, but any other areas had to have the approval of nine members. Its major weakness was from Section Two, which allotted to Congress only the powers expressly delegated therein. Name this precursor to the Constitution, an agreement between the former colonies regarding government.

The Articles of Confederation and Perpetual Union Between the States

#### Round # 8 3<sup>rd</sup> Section Toss-up Questions

#### **Question #17: Miscellaneous – Pop Culture**

10 points

The company "Strategic Investments" involved college students from MIT earning money in this activity. Ben Mezrich wrote about those students in a book that was made into a movie starring Kevin Spacey as a professor. Edward Thorp wrote the seminal book "Beat the Dealer" on how to win at this game, and within it outlined basic card counting. Name this card game in which the player tries to get to 21.

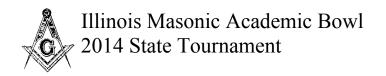
blackjack (accept 21 until the end, accept card counting and prompt on "gambling" until "game")

#### Question #18: Literature – U.S. Literature

10 points

The plan at the center of this story's plot was devised
"during a moment of temporary apparition," and attempted
to play on the philoprogenitiveness of semi-rural
communities. The title event was supposed to net two
thousand dollars but ended up losing two hundred fifty
dollars. That event was poorly planned by the narrator and
Bill Driscoll. Name this O. Henry story in which the central
figure drove the two kidnappers crazy.

"The Ransom of Red Chief"



### Round # 8 3<sup>rd</sup> Section Toss-up Questions

### **Question #19: Science – Biology**

10 points

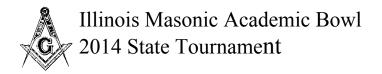
This hormone and adrenaline both bind to 7TM receptors,	glucagon
which increases cyclic AMP, which in turn activates protein	
kinase A [KIH-nase A]. This hormone stimulates a process	
involving malate [MAL-ate] that takes place largely in the	
liver. The level of this hormone increases when somebody is	
hungry, especially during hypoglycemia	
[hie-poe-glie-SEE-mee-uh]. Created in the alpha cells in the	
islets [is-lets] of Langerhans, this hormone is inhibited by	
insulin. Name this chemical that stimulates the body to	
convert glycogen into glucose.	

### **Question #20: Social Studies – World History**

10 points

After leaving his highest post, this leader was in charge of			
foreign affairs on behalf of his son Hidetada			
[hie-dee-tah-dah], and in that role sought to expel all			
Christians from his nation. Held as a hostage by both the			
Oda and Imagawa clans as a youth, this head of Hideyori's			
[hih-deh-yoh-ree's] regency council rose to power following			
victory over Ishida Mitsunari at the Battle of Sekhigahara			
[seh-kee-gah-hah-rah]. Name this founder of the last			
Japanese shogunate.			

Tokugawa Ieyasu (accept Matsudaira Takechiyo or Matsudaira Motoyasu)



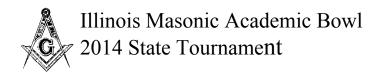
## **Question #21: Science – Physics**

10 points per part

Ar	object with this initial speed will keep moving away	
fro	m an object attracting it. This is the speed a projectile	
ne	eds if it is going to leave Earth's orbit.	
	Name this speed that leads to a straight, hyperbolic, or	<u>escape</u> velocity (or <u>escape speed</u> )
1	parabolic path through space.	
	For a fixed distance from the center of the attracting	$\frac{1}{2}$ (or 0.5, prompt on "square root")
2	object, the escape velocity varies directly with the mass	
	of the attracting object raised to this power.	
	The escape velocity can be found by multiplying the	square root of 2 (or root 2 or
3	speed necessary for a circular orbit by this number.	radical 2 or 2 to the ½ power or
		equivalents)

## **Question #22: Science – Physics**

	ounced in 2013.	
1	Name this Standard Model particle that was found at the Large Hadron Collider at CERN [sern].	Higgs boson (or Higgs particle)
2	The Higgs boson gives mass to the W and Z bosons, which are classified as this type of boson because they are force carriers.	gauge bosons
3	The Higgs boson is classified as this type of boson because its spin is zero.	<u>scalar</u> boson



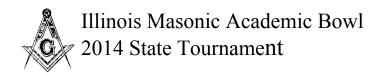
#### **Question #23: Literature – U.S. Literature**

10 points per part

	his play, the protagonist "came into manhood" after king Karl Linder out of his apartment.	
1	Name this drama in which Walter was called a "toothless rat" by Beneatha for agreeing to give up on the house that Lena had put a down payment on.	A Raisin in the Sun
2	A Raisin in the Sun was written by this dramatist, who wrote of a Jewish newspaper owner becoming politically active in The Sign in Sidney Brustein's Window.	Lorraine Vivian Hansberry
3	As the Lee family leaves the apartment for the last time, Lena makes a point of grabbing this item as the lights dim.	her <u>plant</u>

#### **Question #24: Literature – U.S. Literature**

	e protagonist of this novel compared himself to a squirrel aran away like a coward.	
1	Name this novel in which that feeling of cowardice left when Wilson handed over a pack of letters. After the regiment's color-bearer is killed, the main character takes up the task.	The Red Badge of Courage
2	This author of <i>The Red Badge of Courage</i> published two collections of poems, <i>War is Kind</i> and <i>The Black Riders</i> .	Stephen Crane
3	In this Stephen Crane tale, the central object was compared to a bucking bronco. At one point, the cook and the correspondent argued about houses of refuge and life-saving stations.	"The Open Boat"



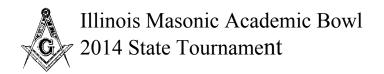
## **Question #25: Mathematics – Trigonometry**

10 points per part

Ans	swer these questions about half angles.	
1	If the cosine of theta is seven ninths, this is the value of the sine of the quantity theta over two. In this problem, you should assume that the angle is in the first quadrant, so you only need to give the positive possible answer.	<u>1/3</u> (or 0 <u>.3 repeating</u> )
2	If the sine of theta is twelve thirteenths, and the cosine of theta is five thirteenths, this is the value of the tangent of theta over two. In this problem, you already know that the angle is in the first quadrant, so you should only give the positive answer.	<u>2/3</u> (or 0 <u>.6 repeating</u> )
3	The tangent of theta over two can be evaluated by subtracting this function from the cosecant [koe-SEE-kant] of theta.	cot angent (of) theta (do not accept "tan" gent theta)

## **Question #26: Mathematics – Trigonometry**

	triangle, a side of length 2 is across from an angle of 45 rees.	
1	Find the length of a side in that triangle if it is across from an angle of 30 degrees.	square root of 2 (accept root 2 or radical 2 or equivalents)
2	The problem you just attempted can be solved using this law stating that within a triangle the ratio of a side length to this law's namesake function applied to the side's opposite angle is constant.	law of <u>sine</u> s
3	Each of those ratios equal not only each other but the diameter of this circle that passes through the triangle vertices.	circumcircle (or circumscribed circle)



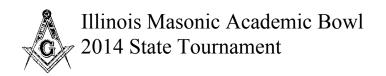
## **Question #27: Social Studies – World History**

10 points per part

	spite assenting to the legitimacy of it, Charles Albert of varia later contested it.	
Dav	varia later contested it.	
	Name this decree that attempted to codify how	<b>Pragmatic Sanction</b> of Holy
1	Hapsburg lands were to be passed down via inheritance.	Roman Emperor Charles VI
2	Following the Treaty of Aix-la-Chappelle [aiks la shah-pel], this husband of Maria Theresa was recognized as Holy Roman Emperor.	Francis Stephen of Lorraine (accept Francis I)
3	Despite being the Hapsburg heir, this law prevented Maria Theresa from inheriting the crown. This law required potential heirs to have only males as direct ancestors.	Salic Law of Succession

## **Question #28: Social Studies – World History**

Aft	er a violation of the Treaty of Margus, this person led	
atta	cks on the Danubian frontier which included the razing	
of S	Singidunum.	
	Name this leader who, during his invasion of Greece,	Attila the Hun (prompt on
	was stopped at Thermopylae [ther-MAH-pih-lay]. After	"Flagellum Dei" or "Scourge of
1	murdering his brother Bleda, he aimed his forces at	God")
	Lower Scythia [SIH-thee-uh] and Moesia	
	[mee-shee-uh].	
	After a number of his raids, Attila raised the rates of	Eastern Roman Empire (prompt
2	tribute that this empire had to pay. It was doubled via	"Roman Empire")
	the Treaty of Margus, and tripled after Attila smashed	
	this empires's forces at Gallipoli [guh-lip-uh-lee].	
	After this sister of Valentinian III sent Attila her ring,	<u>Honoria</u>
3	the ruler demanded half of the Western Roman Empire	
	as a dowry.	



#### Round # 8 5<sup>th</sup> Section Toss-up Questions

## **Question #29: Science – Chemistry**

10 points

These particles are emitted by radioactive static neutralizers as one of the final steps when producing paper. Already used to treat bone cancers, research is being done to attach bismuth and actinium [ak-TIH-nee-um] to sites near tumors to treat other cancers. These particles can cause lung cancer, most commonly doing so after the inhalation of radium. These were aimed at gold foil when the atomic nucleus was discovered by Ernest Rutherford. Name these particles equivalent to a helium nucleus.

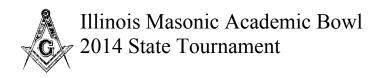
alpha particles (or alpha
radiation, prompt on "helium
nucleus")

#### **Question #30: Literature – World Literature**

10 points

In this story, General Monk is snuck out of England in a coffin before backing Charles the Second as King of England. An intendant in this tale rose to power following the capture of the finance minister. That finance minister learned of a plot to abduct the king at a ball put on by Fouquet [foo-keh]. Name this novel by Alexander Dumas [doo-mah] concerning an alleged twin brother of King Louis the Fourteenth.

The <u>Man in the Iron Mask</u> (accept The <u>Vicomte de Bragelonne</u> or <u>Louise de la Vallière</u> or L'<u>Homme</u> au Masque de Fer)



# Round # 8 5<sup>th</sup> Section Toss-up Questions

## **Question #31: Mathematics – Math Concepts**

10 points

Some versions of the theorem named for this person have	Brook <u>Taylor</u>
the Radius of Convergence Theorem built into them. His	
namesake theorem applies to functions that are smooth at	
x=0. Additionally, some versions have a term attributed to	
Lagrange [lah-GRANJ] or Cauchy [cow-shee] to account	
for errors. His theorem develops polynomials from	
repeatedly differentiable functions. Name this person whose	
namesake polynomials, a specific case of which are	
MacLaurin series, use derivatives and factorials to	
approximate a function.	

## **Question #32: Social Studies – U.S. History**

In 2000, this state saw John Ashcroft lose a Congressional election to a deceased candidate. This state saw the first Civil War battle west of the Mississippi at Wilson's Creek. Dred Scott was ruled to be a slave based on his owner's residence in this state. It gained statehood simultaneously with Maine under a namesake 1820 compromise. Name this state, the site of the 1904 World's Fair held in St. Louis.	Missouri	
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# Round # 8 Extra Section Toss-up Questions

#### Extra Question #1: Literature – World Literature

10 points

In one form, this figure predicted the death of Berlioz [behr-lee-oze] and later hosts a ball in the dead editor's apartment. In one novel, he isolates a man trying to obtain the unobtainable, and later utilizes the Witch's Kitchen in a wager. In another wager, he offered the "empire of the mind," but was countered with the sacred texts of the Hebrews by Jesus. Name this ruler of Hell.

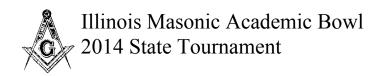
<u>Satan</u> (accept <u>Woland</u>, <u>Lucifer</u>, the <u>Devil</u>, <u>Diabolus</u>, <u>Beelzebub</u>, <u>Belial</u>, <u>Beliar</u>, or equivalents)

#### Extra Question #2: Mathematics – Math Concepts

10 points

Just before he died, this mathematician introduced what he called mock theta functions, which in 2012 were confirmed to be mock modular forms. The prime numbers named for this mathematician signify twofold increases in the prime counting function. A conjecture named for this person led to a conjecture named for him and Hans Petersson. Name this person who immediately recognized that 1,729 is the smallest number expressible as two different sums of cubes, an Indian whose talent was discovered by G.H. Hardy.

#### Srinivasa Ramanujan



# Round # 8 Extra Section Toss-up Questions

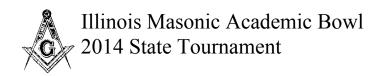
## Extra Question #3: Social Studies – World History

10 points

the <u>overthrow</u> of Salvador <u>Allende</u> (accept clear equivalents)

## Extra Question #4: Science – Biology

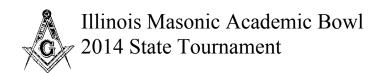
This group of vertebrates included placodermi, whose heads	<u>fish</u>	
and necks were covered by bones. Currently considered to		
consist of several classes, some of these vertebrates contain		
photophores that emit light. This group includes the		
agnatha, which is jawless. Some of these animals have gas		
bladders, and these vertebrates include chondrichthyes [kon-		
DRIK-thees] and osteichthyes [oh-STIK-thees]. Name these		
vertebrates that do not have limbs with digits and which		
include lampreys, rays, sharks, and guppies.		



# Round # 8 Extra Section Toss-up Questions

## Extra Question #5: Fine Arts – Art History

This artist's portrait of a bride wearing red shows a man	Marc Chagall
playing clarinet in the lower right corner and a fish in the	
upper right corner. He used five sections around a circle and	
portrayed characters from famous operas to paint the ceiling	
of the Paris Opera House. One of his paintings shows an	
upside down female violinist near a man walking away with	
a scythe [sieth]. Name this artist who showed a white goat	
and a green man staring at each other in his painting <i>I</i> and	
the Village.	



## Round # 8 Extra Section Teamwork Questions

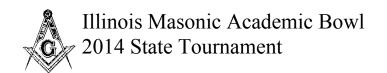
## Extra Question #6: Science – Physics

10 points per part

	ms of this equation are classified as time-dependent or e-independent.	
1	Name this equation fundamental to quantum mechanics that uses the Hamiltonian operator.	<u>Schrödinger</u> 's equation
2	The development of Schrödinger's equation was influenced by this scientist's postulate that all objects have a wave-particle duality.	Louis de Broglie
3	Shortly after Schrödinger developed his equation, this scientist developed his similar equation taking relativity and half spins into account.	Paul <u><b>Dirac</b></u>

## Extra Question #7: Science – Physics

	s law states that if one object exerts a force on a second ect, then the second object exerts a force on the first.	
	Name this law sometimes called the action-reaction	Newton's Third Law (accept any
1	law.	answer that mentions Newton and
		three, prompt on "Third" or "3")
	Newton's Third Law is often used to explain this type	thrust
2	of force that propels a vehicle such as an airplane	
2	forward by pushing its fuel or its environment	
	backwards.	
	Because the gravitational force of two planets affects	<b>perturb</b> ation (accept word forms)
3	both of them, Newton's Third Law has helped locate	
3	planets. Name the disturbance of motion in an orbit	
	caused by something other than the central force.	



# Round # 8 Extra Section Teamwork Questions

## Extra Question #8: Social Studies – World History

10 points per part

	traditional beginning is traced to the 718 Battle of wadonga.	
1	Name this campaign in which Alfonso III took Baeza and Ubeda after winning a major victory at Las Navas de Tolosa.	Reconquista (accept Reconquest)
2	The ultimate goal of the Reconquista was the expulsion of these North African Muslims from the Iberian Peninsula.	<u>Moor</u> s
3	The Reconquista was completed when this queen and her husband gave significant financial backing to the conquest of Granada.	Isabella I of Spain (accept Isabella the Catholic, allow additional references to Ferdinand II of Aragon)

### Extra Question #9: Social Studies – World History

This party's origins can be traced to its country's Peoples'		
Revolutionary Party.		
1	Name this party that, after taking over the government	Khmer Rouge (accept Red
	in 1975, took a page from the French Revolution in	Khmer)
	implementing "Year Zero."	
2	This leader of the Khmer Rouge [keh-mehr rooj]	Pol Pot (accept Saloth Sar)
	became involved in Communism while studying in	
	France. In power, he gave himself the title "Brother	
	Number One."	
3	This late grandson of King Monivong was placed under	Preah Bat Samdech Preah
	house arrest by the Khmer Rouge in 1975. While in	Norodom Sihanouk (prompt on
	exile, led the coalition that fought against the	"Sihanouk")
	Vietnamese invasion.	