



Illinois Masonic Academic Bowl  
2022 Sectional Tournament

**Round 2**  
**1st Section**  
**Toss-up Questions**

**Question #1: Social Studies**

*10 points*

<p>This person described an offer from Stafford Cripps as a “post-dated check drawn on a failing bank.” Cripps had offered dominion status, which this person had almost received a decade earlier through a pact with Lord Irwin. This person then started a movement whose slogan was “Do or Die”, causing him and his followers to be jailed. With Lord Irwin, this person ended the salt tax in exchange for ending the Salt March. While in prison, this person fasted for several weeks in 1943. Name this practitioner of nonviolence who worked with Jawaharlal Nehru [JUH-wah-hur-LAHL NEH-roo] to make India free from the United Kingdom.</p>	<p>Mohandas (Karamchand “Mahatma”) <b><u>Gandhi</u></b></p>
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**Question #2: Miscellaneous**

*10 points*

<p>These objects are often classified by a number and the words “coarse”, “fine”, or “extra fine”, which are written as “U.N.C.”, “U.N.F.”, or “U.N.E.F.”. These objects are a type of simple machine that changes rotational motion into linear motion. Archimedes [ark-ih-MEE-deez] designed a machine that shared a name with these objects and was used to lift water. These objects are very similar to bolts but are typically used without a nut. The heads of these objects come in types like Robertson, slot, and Phillips. Name these metal fasteners that are twisted using a driver.</p>	<p><b><u>screws</u></b> [prompt on <b><u>threads</u></b> before “lift”]</p>
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### Question #3: Mathematics

10 points

If the divergence of a vector field is this type of number, then the field's flux is outward rather than inward. If a correlation coefficient is this type of number, then an independent value greater than the mean is likely paired with a dependent value greater than the mean. If the dot product of two vectors is this type of number, the angle between the vectors is acute. The *range* of exponential functions is these numbers, and the *domain* of logarithmic functions is these numbers. If a slope is this type of number, then a line is increasing. Give this term for numbers greater than zero.

positive real numbers [or positive reals; accept positives; before the end, prompt on descriptions like numbers greater than 0 or numbers larger than 0; do not accept answers containing "non-negative"]

### Question #4: Literature

10 points

A fallacy named for this part of speech was developed by Amos **Tversky** [t'-VUR-skee] and Daniel **Kahneman** [KAH-nuh-mun], and it is sometimes called the Linda problem. The adjective "**syndetic**" [sin-DET-ik] refers to words that are used with this part of speech. The subordinating types of this part of speech can be remembered by using the mnemonic "On a white bus", and the coordinating ones correspond to the mnemonic "FANBOYS". An Oxford comma occurs immediately before one of these parts of speech. Name this part of speech, used to connect words or phrases, whose most common examples are "and" and "or".

conjunctions



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**Question #5: Science**

10 points

When an object moves in circular motion due to a magnetic field, this quantity equals mass times velocity divided by the quantity radius times magnetic field strength. Capacitance equals this quantity divided by electric potential difference. The elementary value for this quantity was measured in Robert Millikan's oil drop experiment. The force of a magnetic field on a particle equals this quantity times the cross product of velocity with magnetic field. Electric current is the rate of flow of this quantity. Name this quantity that is measured in **coulombs** [KOO-lohmz] and which is positive for protons and negative for electrons.

electric **charge**

**Question #6: Social Studies**

10 points

The federal government cannot forcibly remove this status according to the *Afroyim* [uh-FROY-im] v. *Rusk* decision. This status can be granted according to the doctrines of *jus sanguinis* ["use" "SAN"-gwin-iss] and *jus soli* ["use" SOH-lee], the latter of which has been used in the U.S. since a court decision involving Wong Kim Ark. The first clause of the 14th Amendment of the Constitution nullified the *Dred Scott v. Sanford* ruling, which had said Dred Scott did not have this status. People who hold a green card can apply for this status after five years. Name this status that, in the U.S., a person can achieve by being native-born or being naturalized.

**citizenship** [or being a **citizen**]



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**Round 2**  
**2nd Section**  
**Teamwork Questions**

**Question #7: Science**

*10 points per part*

These elements form the right edge of the periodic table.		
<b>1</b>	Identify this group of elements whose first two members are helium and neon.	<u>noble</u> gases [accept group <b>18</b> or <u>aerogens</u> ; do not accept “inert gases”]
<b>2</b>	This rule traditionally explained the lack of reactivity of noble gases. It states that elements tend to bond so that there are eight electrons in their valence shells.	<u>octet</u> rule
<b>3</b>	This is the name of element 118, which was discovered in 2002. Theoretically, this element is less inert than other noble gases, but that might not matter because it decays quickly.	<u>oganesson</u> [ <u>oh-guh-NESS-ahn</u> ] [prompt on <b>Og</b> ]

**Question #8: Science**

*10 points per part*

This phase transition is the opposite of melting.		
<b>1</b>	Name this transition from a liquid state to a solid state.	<u>freezing</u> [accept <u>freeze</u> ]
<b>2</b>	Because substances have a latent heat of this process, which is also known as an enthalpy of this process, freezing requires the removal of a significant amount of heat.	<u>fusion</u>
<b>3</b>	This phrase describes a very fast freezing process using very low temperatures, often to freeze food without forming ice crystals.	<u>flash</u> freezing [prompt on <u>quick</u> freezing]



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**Teamwork Questions**

**Question #9: Literature**

*10 points per part*

This poem begins with the sentence “This is the forest <b>primeval</b> [pry-MEE-vull].”		
<b>1</b>	Name this epic poem about a woman’s search for Gabriel <b>Lajeunesse</b> [lah-zhoo-ness].	<b><u>Evangeline</u></b> (, <i>A Tale of Acadie</i> )
<b>2</b>	This Fireside poet wrote <i>Evangeline</i> as well as <i>The Song of Hiawatha</i> .	Henry Wadsworth <b><u>Longfellow</u></b>
<b>3</b>	Henry Wadsworth Longfellow started his poem about this person with the line “Listen, my children, and you shall hear.”	Paul <b>Revere</b> [accept “ <b><u>Paul Revere</u></b> ’s Ride”]

**Question #10: Literature**

*10 points per part*

A poem by this writer begins “I felt a Funeral, in my Brain.”		
<b>1</b>	Name this poet who lived in Amherst, Massachusetts.	Emily (Elizabeth) <b><u>Dickinson</u></b>
<b>2</b>	One Dickinson poem begins by saying that she “could not stop for” this concept.	<b><u>Death</u></b>
<b>3</b>	Another Dickinson poem begins by saying that she is this concept and asking “Who are you?”. The poem expresses hope that “Then there’s a pair of us!”.	<b><u>nobody</u></b> [must be exact]



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**Teamwork Questions**

**Question #11: Fine Arts**

10 points per part

Chamber music is written for a small number of instruments that each play their own part.		
1	This composer's chamber music includes at least 68 string quartets, making him the "Father of the String Quartet". He also wrote over 100 symphonies.	(Franz) Joseph <u>Haydn</u>
2	This composer put a wrinkle in chamber music line-ups when his <i>Trout Quintet</i> included a double bass instead of a second violin.	Franz (Peter) <u>Schubert</u>
3	In modern times, some composers have written chamber music for the same combination of instruments as this Arnold <u>Schoenberg</u> [SHURN-berg] song cycle: singer, flute, clarinet, violin, cello, and piano.	( <i>Dreimal sieben Gedichte aus Albert Girauds</i> ) <u>Pierrot Lunaire</u> [prompt on <u>Pierrot</u> ensemble]

**Question #12: Fine Arts**

10 points per part

This composer wrote keyboard pieces in all 24 major and minor keys in <i>The Well-Tempered Clavier</i> [KLA-vee-ur].		
1	Name this German Baroque composer who also wrote the <i>Goldberg Variations</i> .	Johann Sebastian <u>Bach</u>
2	Bach wrote many of these <u>contrapuntal</u> [kahn-truh-PUN-tul] compositions, including many of the parts of <i>The Well-Tempered Clavier</i> . A piece he worked on at the end of his life is titled <i>The Art</i> of this type of music.	<u>fugue(s)</u> [fyooog]
3	<i>The Art of Fugue</i> used a <u>motif</u> [moh-TEEF] that spelled Bach's name. This 19th-century composer later wrote <i>Fantasy and Fugue on the Theme B-A-C-H</i> .	Franz <u>Liszt</u> ["list"] [or <u>Liszt</u> Ferenc]



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**2nd Section**  
**Teamwork Questions**

**Question #13: Social Studies**

*10 points per part*

When this type of payment is required for imports or exports, it is called a tariff.		
<b>1</b>	Name this required payment to a government. In the U.S., it is often levied on income and sales.	<u>taxes</u> [or <u>taxation</u> ]
<b>2</b>	Income taxes are often structured so that as the taxed amount increases, the taxation rate also increases. What term refers to that scheme?	<u>progressive</u> (income) taxation
<b>3</b>	This measure that uses the area between the line of equality and the Lorenz curve measures economic inequality. A progressive tax moves this quantity closer to zero.	<u>Gini</u> [ <u>JEE-nee</u> ] coefficient

**Question #14: Social Studies**

*10 points per part*

In the early 1980s, the only retirement account for 60% of U.S. private sector workers was the defined-benefit type of this plan, but that number is now down to 4%.		
<b>1</b>	Name this type of retirement plan that is still common for public-sector workers such as teachers.	<u>pensions</u>
<b>2</b>	Private-sector workers now more commonly use these defined-contribution plans named for the part of the Internal Revenue Code that describes them.	<u>401(k)</u> plans
<b>3</b>	When he was Chief Economist of the World Bank in 1999, this economist teamed with Peter Orszag [ <u>OR-sag</u> ] to write “Rethinking Pension Reform”. This economist more recently wrote <i>People, Power, and Profits</i> .	Joseph (Eugene) <u>Stiglitz</u> [ <u>STIG-lits</u> ]



Illinois Masonic Academic Bowl  
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**Round 2**  
**3rd Section**  
**Toss-up Questions**

**Question #15: Science**

10 points

This order contains an animal called the **coypu** [KOY-poo], though Americans use the name “**nutria**” [NOO-tree-uh] because of a trade name for the animal’s fur. Animals in this order are responsible for spreading Lassa fever and other roboviruses. This order has far more species than any other order of mammals. This order is characterized by continuously growing incisors from both jaws. Animals in this order usually do not migrate, but lemmings do. The largest animal in this order is the **capybara** [kap-ee-BAIR-uh]. These animals live on land, though muskrats and beavers are in this order and are good swimmers. Name this order that includes guinea pigs, rats, and mice.

rodents or Rodentia

**Question #16: Literature**

10 points

One poem by this writer describes the actions of the invisible worm and then states “His dark secret love does thy life destroy.” This author of “The Sick Rose” wrote a poem about little Tom **Dacre** [DAY-kur] that begins “When my mother died I was very young” and in which Tom is told “When your head’s bare, you know that the soot cannot spoil your white hair.” In addition to “The Chimney Sweeper”, this author wrote a poem that asks “Did he who made the Lamb make thee?”. This poet addressed that poem to an animal that is “burning bright, in the forests of the night.” Name this English poet whose *Songs of Innocence and of Experience* includes “The Tiger”.

William Blake





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**3rd Section**  
**Toss-up Questions**

**Question #17: Fine Arts**

*10 points*

This statue is surrounded by stone walls that form an 11-pointed star and that used to be part of Fort Wood. Part of this statue was redesigned by Gutzon Borglum so that it now contains hundreds of pieces of tinted yellow cathedral glass. Shortly before designing the Biltmore Estate and The Breakers for the Vanderbilts, Richard Morris Hunt designed the pedestal for this statue. The framework for this statue was built by **Gustave Eiffel** [goo-stahf “eye”-ful], and its design is by Frédéric Auguste **Bartholdi** [bar-tohl-dee]. This copper sculpture shows a woman holding a book and lifting up a torch. Name this sculpture that welcomes immigrants in New York Harbor.

The **Statue of Liberty**  
[or **Liberty Enlightening**  
**the World** or La **Liberté**  
**éclairant le monde**]

**Question #18: Social Studies**

*10 points*

One of the first actions this person took as a leader was to name Martin Crawford, Andre Roman, and John Forsyth to a peace commission that was never received. This person was eventually captured near Irwinville and held for two years, but he was never put on trial and eventually went to Canada. Leading into the Hampton Roads Conference, this person feuded with the person next in line for his job, Alexander **Stephens** [STEE-venz]. This person had earlier been Franklin Pierce’s secretary of War and a congressperson from Mississippi. Name this person who appointed Robert E. Lee as his top general when this person was President of the Confederate States.

Jefferson (Finis) **Davis**



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**3rd Section**  
**Toss-up Questions**

**Question #19: Science**

*10 points*

The amount of this gas is measured by a technique developed by John **Tyndall** [TIN-dul] that uses infrared absorption. That method is used in both capnography and at the Mauna Loa Observatory. **Amines** [AM-eenz] are sometimes used to collect this gas, which can then be stored underground or underwater. In 2018 the U.S. Congress passed tax breaks for companies who follow that process, which is sometimes called the “capture” of the first element in this gas’s name. The amount of this gas in the atmosphere recently went above 400 parts per million. Name this greenhouse gas that is released by the burning of fossil fuels.

carbon dioxide or CO<sub>2</sub>  
[do not accept or prompt  
on “carbon”]

**Question #20: Literature**

*10 points*

Six different women say something negative to this character right before she goes to Redmond College. Two of those women belong to the Wright family, which this character’s friend Diana marries into while this person is in college. As a child, this character saved Diana’s sister Minnie May’s life by giving her **ipecac** [IP-uh-kak] for **croup** [kroop]. This character was adopted by Matthew and Marilla Cuthbert, who had actually requested a boy. Once adopted, this character grows up in **Avonlea** [AV-un-lee] on Prince Edward Island. Name this character in stories by Lucy Maud Montgomery who grew up on a farm called Green Gables.

Anne Shirley [accept  
either; accept Anne of  
(the) Green Gables]



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**Round 2**  
**4th Section**  
**Teamwork Questions**

**Question #21: Mathematics**

*10 points per part*

Both $a$ and $b$ can be described by this term in the equation " $x$ over $a$ plus $y$ over $b$ equals 1".		
<b>1</b>	Give this term for a point at which the graph of a function or relation intersects the $x$ - or $y$ -axis.	( $x$ - and/or $y$ -) <u>intercept</u> (s)
<b>2</b>	Find the $y$ -intercept for the line " $2x$ plus $3y$ equals 24".	<u>8</u> or <u>(0, 8)</u>
<b>3</b>	Find the $x$ -intercept for the function " $y$ equals $-2$ plus the log base 3 of $x$ ".	<u>9</u> or <u>(9, 0)</u>

**Question #22: Mathematics**

*10 points per part*

<b>Apollonius</b> [ap-uh-LOH-nee-uss] of Perga wrote a book about slices of this solid.		
<b>1</b>	Name this solid with a circular base and an apex.	(right circular) <u>cone</u>
<b>2</b>	Find the volume of a cone with a radius of 5 units and a height of 3 units.	<u>25 pi</u> cubic units
<b>3</b>	Find the slant height of a cone with a radius of 5 units and a height of 3 units.	square <u>root</u> of <u>34</u> [accept <u>radical 34</u> ; do not prompt on "34"]



**Question #23: Literature**

*10 points per part*

Name these mythological stones:		
<b>1</b>	Though some people thought this object was a cup, Wolfram von Eschenbach thought it was a stone. King Arthur's knights went on quests for this object.	holy <u>grail</u>
<b>2</b>	This stone is an actual stone near Cork, Ireland. People believe that kissing it improves speaking ability.	<u>Blarney</u> stone
<b>3</b>	This god is often represented in temples by stones called <b>lingas</b> [LEEN-guhs].	<u>Shiva</u> [or <u>Siva</u> ]

**Question #24: Literature**

*10 points per part*

Name these gods who had magical arrows:		
<b>1</b>	This Roman god was the counterpart of the Greek Eros, spelled "E-R-O-S". This god's arrows made people fall in love.	<u>Cupid</u>
<b>2</b>	The sudden deaths of women were supposedly caused by arrows shot by this Greek goddess of the hunt.	<u>Artemis</u>
<b>3</b>	This Knight of the Round Table beheaded <b>Denoalan</b> [deh-NOH-uh-lan] and then shot Denoalan's brother Godwin when Godwin spied on this man and his wife <b>Iseult</b> [ih-SOOLT].	<u>Tristan</u>



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**Round 2**  
**4th Section**  
**Teamwork Questions**

**Question #25: Science**

*10 points per part*

A UCSF study found that the risk of COVID-19 complications rises 50% to 100% in people who engage in either this activity or smoking.		
<b>1</b>	Give this colloquial term for using e-cigarettes.	<u>vaping</u> [or <u>vapes</u> ]
<b>2</b>	This term, which is synonymous with “stepping-stone” or “opening”, is used to express the possibility that the use of e-cigarettes by children may lead to the use of cigarettes or drugs. Similarly, the use of illicit drugs sometimes leads to the use of harder drugs.	<u>gateway</u> drugs
<b>3</b>	Preliminary research indicates that vaping increases this inflammation of the gum tissue around teeth. The first stage of this disease is <u>gingivitis</u> [jin-juh-VY-tiss].	<u>periodontitis</u> [prompt on <u>periodontal disease</u> ]

**Question #26: Science**

*10 points per part*

According to the National Survey on Drug Use and Health, about 20 million Americans have a substance use addiction.		
<b>1</b>	The most common substance use addiction is to this compound used in drinks.	<u>alcohol</u> [or <u>ethanol</u> ; accept <u>alcoholism</u> ]
<b>2</b>	Over 2 million people have an addiction to this class of drugs, such as prescription pain relievers and heroin.	<u>opioids</u> [prompt on <u>opiates</u> ]
<b>3</b>	This drug is used to prevent respiratory arrest due to opioids. It can be given as a nasal spray to a person who has overdosed.	<u>Naloxone</u> [nuh-“LOCK”-sohn] [accept <u>Narcan</u> or <u>Evzio</u> or <u>Nyxoid</u> or <u>Kloxxado</u> ]



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**Round 2**  
**4th Section**  
**Teamwork Questions**

**Question #27: Social Studies**

*10 points per part*

This day is June 6, 1944.		
<b>1</b>	Name the day of the Normandy landings during Operation Overlord in World War II.	<u>D</u> -Day
<b>2</b>	The Normandy coast was divided into five so-called beaches. Give the codename of the deadliest one, which was named for a U.S. city.	<u>Omaha</u> Beach
<b>3</b>	Shortly after D-Day, the Soviets launched this operation that resulted in hundreds of thousands of casualties and the Soviets retaking what is now Belarus [BELL-uh-rooss].	Operation <u>Bagr</u> ation

**Question #28: Social Studies**

*10 points per part*

In 1872, the Equal Rights Party nominated Victoria Woodhull for president and this man for vice president.		
<b>1</b>	Name this abolitionist and orator who wrote three autobiographies, including <i>My Bondage and My Freedom</i> , that described his escape from slavery.	Frederick <u>Douglass</u> [or Frederick (Augustus Washington) <u>Bailey</u> ]
<b>2</b>	Inspired by William Lloyd Garrison's <i>The Liberator</i> , Douglass started this newspaper in 1847.	<i>The</i> <u>North Star</u>
<b>3</b>	Douglass published <i>The North Star</i> in this city, where he also delivered his "What to the Slave Is the Fourth of July?" speech.	<u>Rochester</u> , New York



**Question #29: Literature**

10 points

One play by this writer begins with a character saying “Yes, I have tricks in my pocket; I have things up my sleeve.” This writer depicted that character getting yelled at after Jim says he is engaged, which disappoints Amanda and Laura. In another play by this writer, a woman tells Mitch that her first husband Allan Grey committed suicide. This writer depicted that woman moving in with her sister and brother-in-law, Stella and Stanley. Name this playwright who wrote about the Wingfield family in *The Glass Menagerie* and wrote about Blanche DuBois [doo-bwah] in New Orleans in *A Streetcar Named Desire*.

Tennessee Williams [or Thomas Lanier Williams III]

**Question #30: Social Studies**

10 points

This leader sent the followers of Aulus Gabinius [OW-looss guh-BEE-nee-uss] to Marcus Bibulus [BEE-boo-luss] in Syria, and historians disagree as to whether or not Bibulus sent them back. This person went to Syria to build an army to fight a civil war against Arsinoe IV [ar-SIN-aw-ee “the 4th”] and Ptolemy XIII [TAH-luh-mee “the 13th”]. This person was successful after Ptolemy ordered the death of Pompey the Great, which led to Julius Caesar supporting this person. After this leader’s death years later, Egypt became a Roman province. During the Battle of Actium [AK-tee-um], this leader supported Mark Antony, and this leader committed suicide soon after Octavian’s victory. Name this leader who ruled Egypt with Caesarion [suh-ZAR-ee-un], who was her son.

Cleopatra (VII Philopator)



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**Round 2**  
**5th Section**  
**Toss-up Questions**

**Question #31: Science**

10 points

In recent years, the Tian–Calvet types of these devices have been used to determine which materials should be used in batteries. These devices are not microscopes, but the differential scanning types are used to study liquid crystals and **polymers** [POL-uh-murz]. When these devices are used, they often contain a chemical reaction that involves enthalpy changes. Many of these devices use a liquid enclosure that can be measured, including the “bomb” type of this device. Data from these devices are often used to calculate the heat capacity of materials. Name these devices that measure the amount of heat during a reaction.

**calorimeters**  
[kal-uh-RIM-ih-turz]  
[accept  
micro**calorimeters**]

**Question #32: Mathematics**

10 points

The most common statement of **Menelaus’s** [men-uh-LAY-uss’z] theorem sets the product of the ratio of three lengths equal to this number by taking direction into account. If a series of positive numbers is decreasing, then multiplying the terms by powers of this number gives a converging series according to the alternating series test. According to **Euler’s** [OY-lur’z] identity, this number equals  $e$  raised to the power of  $i$  times pi. Using this number as an exponent is equivalent to taking the reciprocal, and writing this number as a superscript is used to represent the inverse of a matrix or function. Identify this number whose square root equals  $i$ .

−1





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**Round 2**  
**Extra Section**  
**Toss-up Questions**

**Extra Question #1: Social Studies**

*10 points*

This person is often portrayed with his right hand touching the ground to show the moment when the Earth told this person “I bear you witness.” That occurred when this person overcame the demon Mara, whose daughters were used to tempt this person. Some depictions of this person show him being protected by a snake-like being named **Mucalinda** [moo-kah-LIN-duh]. Those events occurred before this person traveled to **Sarnath** [SAR-nuth], where he taught about suffering, the cause of suffering, the end of suffering, and the eight-fold path. Name this former prince who taught about the Four Noble Truths in ancient India.

**Siddhartha Gautama**  
[accept either; accept the **Buddha**; accept **Bhagavat** or **Tathagata**]

**Extra Question #2: Science**

*10 points*

An alloy of this element and **niobium** [ny-OH-bee-um] is used to make superconducting magnets. This element is in many minerals, including with oxygen in **ilmenite** [ILL-muh-“night”] and **rutile** [ROO-teel]. From those minerals, the tetra-chloride of this element can be formed from the Kroll process. The di-oxide of this element is a white pigment that is often combined with zinc oxide in sunscreens. The combination of high strength and low density of many alloys of this metal make them useful in spacecrafts and high-speed aircraft. Though this metal is too expensive for most commercial cars, it has become common in prosthetics. Name this element whose chemical symbol is **Ti** [spell out].

**titanium** [accept **Ti** before the end]



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**Round 2**  
**Extra Section**  
**Toss-up Questions**

**Extra Question #3: Literature**

10 points

One of this author's characters lives in the Last Homely House. That character, who appears in several of this author's books, gives the advice "Stand by the grey stone when the thrush knocks" based on his reading of moon letters. This author also had that character save one of his protagonists at the Ford of Bruinen [BRY-nen] and then allow the protagonist to recover at Rivendell. In addition to Elrond, this author describes a character who celebrates his "eleventy-first" birthday and possesses an object that was forged by Dark Lord Sauron. Name this author of <i>The Hobbit</i> and <i>The Lord of the Rings</i> .	J(ohn) R(onald) R(euel) <u>Tolkien</u>
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**Extra Question #4: Fine Arts**

10 points

A ballet by this composer has been popular since a 1940 version of it was put together by the choreographer Leonid Lavrovsky [lav-RAWFF-skee]. This composer wrote "The Street Awakens" and "Dance of the Girls with Lilies" for that ballet. In another work by this composer, the question "What kind of bird are you if you can't fly?" is asked by a bird to a duck. This composer represented the duck with an oboe theme, while the grandfather was represented by a bassoon. Name this 20th-century Russian composer of <i>Romeo and Juliet</i> and <i>Peter and the Wolf</i> .	Sergei <u>Prokofiev</u>
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**Extra Question #5: Mathematics**

*10 points*

This number is the smallest abundant number, since its five proper divisors sum to more than this number. The cosine of pi divided by this number equals one-fourth of the quantity “root 6 plus root 2”. One **Platonic** [pluh-TAH-nik] solid has this many pentagonal faces. This number is the number of *vertices* of an **icosahedron** [“eye”-KAH-suh-HEE-drun] and the number of *edges* of both a cube and an **octahedron** [ahk-tuh-HEE-drun]. This number is the modulus used in clock arithmetic. Give the number of sides of a **dodecagon** [doh-DEK-uh-gahn].

**12**



### Extra Question #6: Mathematics

*10 points per part*

These sequences are alternating if their common ratio is negative.		
<b>1</b>	Name this type of sequence in which each term equals a constant times the previous term.	<b><u>geometric</u></b> sequence
<b>2</b>	Find the common ratio if the fifth term of a geometric sequence is 10 and the eighth term is 640.	<b><u>4</u></b>
<b>3</b>	Find the sum of all the terms in an infinite geometric series if the first term is 10 and the second term is 8.	<b><u>50</u></b>

### Extra Question #7: Mathematics

*10 points per part*

The length of this type of segment is often represented by the letter $h$ because it is equivalent to the height.		
<b>1</b>	Give this term for a segment that connects a vertex of a triangle to the opposite side and is perpendicular to the side.	<b><u>altitude(s)</u></b>
<b>2</b>	Find the length of a triangle altitude if it is in a triangle with an area of 20 square units and it is perpendicular to a side of length 5 units.	<b><u>8</u></b> units
<b>3</b>	Find the length of the altitude to the hypotenuse of a right triangle if the altitude divides the hypotenuse into segments of lengths 3 units and 12 units.	<b><u>6</u></b> units



### Extra Question #8: Social Studies

10 points per part

This country was headed by Carlos Andrés Pérez from 1974 to 1979 and from 1989 to 1993.		
1	Name this South American country with large oil reserves whose capital is <b>Caracas</b> [kuh-RAH-kus].	(Bolivarian Republic of) <b>Venezuela</b> [or (República Bolivariana de) <b>Venezuela</b> ]
2	A few years after Pérez was removed for embezzlement, this leader was elected in 1998, and he ruled until he died in 2013. He centralized power and tried to redistribute wealth.	Hugo <b>Chávez</b> (Frías) [ooh-goh <b>CHAH-vez</b> ]
3	While Chávez ran Venezuela, many South American countries moved leftward, including this one that elected its first indigenous president, <b>Evo</b> [AY-voh] Morales.	(Plurinational State of) <b>Bolivia</b> [or (Estado Plurinacional de) <b>Bolivia</b> ]

### Extra Question #9: Social Studies

10 points per part

This war was interrupted by the Peace of <b>Nicias</b> [NISH-ee-uss].		
1	Name this 5th-century war fought by the <b>Delian</b> [DEE-lee-un] League against a league led by Sparta that this war is named for.	<b>Peloponnesian</b> [pell-uh-puh-NEE-zhun] War
2	This Athenian historian served as a general during the war and wrote the <i>History of the Peloponnesian War</i> .	<b>Thucydides</b> [thoo-SID-ih-deez]
3	This number is both the number of years in the name of the peace plan that preceded the war and the number of tyrants put in charge of Athens after the war.	<b>30</b> (years or tyrants)