

# Illinois Coaches Association 1996 Tournament Semifinals TRIAD QUESTIONS

1.

## TOSS-UP MATH

From 0 to  $2\pi$  inclusive, what are all the solutions to the equation 2 times the sine of X times the cosine of X equals 4 times the sine of X?

ANSWER—(0,  $\pi$  &  $2\pi$ )

1.

## BONUS MATH

Given a right triangle with angles A, B and C, with C the right angle, if the tangent of angle B is equal  $24/7$ , answer the following.

1. What is the tangent of angle A.
2. What is the secant of angle B.
3. What is the cosecant of angle A.
4. What is the cotangent of angle B.
5. What is the sine of angle B.

ANSWER—1.  $(7/24)$     2.  $(25/7)$     3.  $(25/7)$     4.  $(7/24)$     5.  $(24/25)$

2.

## TOSS-UP SCIENCE

In its isomeric form of two fused cyclobutene rings it is known as Dewar benzene and decays with a half-life of two days into its more common form. For ten points name this chemical with formula  $C_6H_6$  which was first isolated by Michael Faraday and whose structure was first successfully posited by August Kekule.

ANSWER—(Benzene)

2.

## BONUS SCIENCE

Perform the following calculations in chemistry.

1. If a solution has a hydrogen ion concentration of  $1 \times 10^{-6}$  molar, what is the solution's pH value.
2. If 72 grams of a substance with a molecular weight of 24 grams per mole is completely dissolved in 2 liters of water, what is the molarity of the resulting solution.
3. If a rigid six liter container holds 2 moles of nitrogen gas at 27 degrees Celsius, then what is the nitrogen's pressure in terms of the universal gas constant R.
4. If the container in part three is suddenly heated to 327 degrees Celsius, then what is nitrogen's new pressure in terms of R.

ANSWER—1. (Six)    2. (1.5 molar)    3. (100R)    4. (200R)

3.

## TOSS-UP LITERATURE

In exchange for two hundred pounds a year and a butt of sack, the original duties of the person occupying this post were to compose odes in honor of the sovereign's birthday and celebration of state occasions. The first to bear the title was Sir William Davenant but the first to perform the duties was Ben Jonson. For ten points name this post which has been held by such men as Dryden, Wordsworth and Tennyson.

ANSWER—(Poet Laureate)

3.

**BONUS LITERATURE**

Identify the Scottish author of the following.

1. The Life of Samuel Johnson.
2. The Lay of the Last Minstrel.
3. A Red, Red Rose.
4. Treasure Island.

ANSWER—1.(James Boswell)      2.(Sir Walter Scott)      3.(Robert Burns)  
4.(Robert Louis Stevenson)

4.

**TOSS-UP FINE ARTS**

One day while out playing their instruments on the street, a group of musicians went up to the house of a famous clown and began to play. The clown came out and asked who composed the music and when this young man shouted, "I did" he was invited in and given a commission. For ten points name this man who went onto compose The Creation, the Farewell Symphony and the Surprise Symphony.

ANSWER—(Franz Joseph Haydn)

4.

**BONUS FINE ARTS**

Identify the following Baroque composers from a work.

1. The Four Seasons.
2. Water Music.
3. Canon and Gigue for Strings in D major.
4. The Fairy Queen.

ANSWER—1.(Antonio Vivaldi)      2.(George Friderick Handel)      3.(Johann Pachelbel)  
4.(Henry Purcell)

5.

**TOSS-UP MISCELLANEOUS**

First appearing in a collection of sayings by John Ray in 1670, it was also used by Sir Walter Scott in Guy Mannering. However, it was not popularized until the 19th century when Commodore Tatnall sent it as a message to the US Secretary of the Navy as the reason he had assisted a British squadron which was under attack in the Pei-Ho River in China. For ten points name this phrase which uses two fluids to state that those who you know are more important than those who you don't.

ANSWER—(Blood is thicker than water)

5.

**BONUS MISCELLANEOUS**

Given a person's name, identify the religion they founded.

1. Joseph Smith.
2. John Calvin and John Knox.
3. Marcus Garvey and Haile Selassie.
4. Vardhamana Mahavira.

ANSWER—1.(Mormonism or Church of Jesus Christ of Latter-Day Saints)  
2.(Presbyterianism)      3.(Rastafarianism)      4.(Jainism)

6.

**TOSS-UP SOCIAL STUDIES**

The name is the same. The ancient name for the Scottish highlands which was also sometimes applied to the entire region of Britain north of the Humber river, the current name of the land known as Epirus to the ancient Greeks and the European country whose capital is Tirana. For ten points give the common name which is also the capital of New York state.

ANSWER—(Albania or Albany)

6.

**BONUS SOCIAL STUDIES**

On May 13, 1940, the Prime Minister of Great Britain gave a speech before the House of Commons in which he exhorted his countrymen to continue fighting Germany and offered four things that he could give.

1. Name the Prime Minister.

2 - 5. Name the four things the Prime Minister offered for the fight against the Axis in his speech "I have nothing to offer but..."

ANSWER—1. (Winston Churchill)    2-5. (Blood, toil, tears and sweat)

7.

**TOSS-UP LITERATURE**

He fought against the encroachment of Philip II for 9 years before being selected as an ambassador to conclude a peace with Philip. Famous for improving his oration by speaking at the sea with pebbles in his mouth, his speeches influenced Cicero as well as unified opposition to Macedon. For ten points name this Greek famous for his Philippics.

ANSWER—(Demosthenes)

7.

**BONUS LITERATURE**

Identify the following about Hamlet.

1. The name of the castle in which the play is set.

2. the name of the play Hamlet stages.

3. The name of Polonius' son.

4. In whose arms does Hamlet die.

ANSWER—1. (Elsinore)    2. (The Murder of Gonzago)    3. (Laertes)    4. (Horatio)

8.

**TOSS-UP MATH**

Find either of the critical points of the function  $F$  of  $X$  equals  $2X$  cubed plus  $3X$  squared minus  $12X$ ?

ANSWER—(1, negative 7) or (negative 2, 20)

8.

**BONUS MATH**

Find the tangent line in slope intercept form of the following functions given a point.

1.  $F$  of  $X$  equals  $2X$  squared at  $(2, 8)$ .

2.  $F$  of  $X$  equals  $4X$  squared minus  $2X$  plus  $5$  at  $(1, 7)$ .

3.  $F$  of  $X$  equals  $4X$  cubed plus  $4X$  squared plus  $5X$  plus  $10$  at  $(2, 68)$ .

ANSWER—1. ( $Y = 8X$  minus  $8$ )    2. ( $Y = 6X$  plus  $1$ )    3. ( $Y = 69X$  minus  $70$ )

9.

**TOSS-UP SOCIAL STUDIES**

On July 18<sup>th</sup>, 1938 he was going to make a simple flight from New York to California in his Curtiss Robin J-6 monoplane. According to him though, he lost sight of the ground due to fog after taking off from Floyd Bennett Field and made a wrong turn over Long Island. For ten points name this man who became famous for his wrong turn when he ended up in Ireland.

ANSWER—(Douglas "Wrong way" Corrigan)

**9.**

**BONUS SOCIAL STUDIES**

Answer the following questions relating to the only US president ever impeached.

1. Who was he.
2. What was the name of the law that he violated which caused him to be impeached.
3. He violated the law in question two by firing what Federal Official.
4. He missed being convicted in the Senate by one vote. What was the name of the man that cast the deciding vote.

**ANSWER—1.(Andrew Johnson)    2.(Tenure of Office Act)    3.(Edwin Stanton)  
4.(Edmond Ross)**

**10.**

**TOSS-UP SCIENCE**

When its atmosphere was first detected by Gerard Kuiper in 1944, it was believed to only be a thin covering of methane. Further study by the Voyager probes showed that it had a nitrogen atmosphere that was thicker than earth's, and that it also had oceans made of ethane. For ten points name this largest satellite of Saturn, named after a group of early figures in Greek mythology.

**ANSWER—(Titan)**

**10.**

**BONUS SCIENCE**

Identify the following objects a star will turn into as it becomes smaller and denser.

1. With a mass not exceeding 1.4 times that of the sun, this type of dwarf star is about the size of the earth and occurs when the internal fusion rate has decreased enough so that it cannot withstand its own gravity.
2. Also known as pulsars, these stars occur when the mass is high enough so that the protons and electrons are crushed into neutral particles into this type of star which has a diameter of less than 10 miles.
3. Not yet observed, this type of star has so much mass that the neutrons are compressed further until they break up into an even smaller sphere composed of these particles which make up protons and neutrons.
4. Stars with even higher masses have so much gravity that they collapse into this type of objects which has a point mass and from which nothing can escape.

**ANSWER—1.(White dwarf)    2.(Neutron star)    3.(Quarks)    4.(Black holes)**

**11.**

**TOSS-UP SCIENCE**

Previously believed to have lasted from 600 million to 450 million years ago, this geologic period is now defined to have lasted from 543 to 510 million years ago. Lying between the Vendian and Ordovician periods, it was during this period that most modern phyla evolved. For ten points name this geologic period, the first of the Paleozoic, which came after the Precambrian time.

**ANSWER—(Cambrian)**

**11.**

**BONUS SCIENCE**

Identify the following about the bottom of the earth's oceans.

1. Including a 148 foot one known as the Godzilla, these hydrothermal vents are essentially geysers which spew mineral laden water at 700 degrees Fahrenheit into the oceans. The minerals are dumped onto the floor by the cooling water and they harden and form characteristic chimneys. Name these vents.

1. Living around these vents are bacteria, such as Beggiatoa, which are chemosynthetic. They survive by deriving energy from this molecule, H-two-S, not sunlight.

3. The largest geologic feature on the planet, this 31,000 mile long mountain range runs through all the world's oceans and gets its name from its position, which is generally in the middle of each ocean.

4. Also known as seismic sea waves, not tidal waves, these long period ocean waves are produced by the movement of the sea floor as caused by earthquakes, volcanoes or landslides.

ANSWER—1. (Black smokers)      2. (Hydrogen sulfide)      3. (Mid-Ocean[ic] Ridge)  
4. (Tsunami)

**12.**

**TOSS-UP SOCIAL STUDIES**

A former member of the Palmach underground army, the Harel Brigades and the Army Chief of Staff during the Six-Day War, he was supposed to succeed Golda Meir as Prime Minister in the 70's but his Labor Party was voted out of office. For ten points name this Israeli Prime Minister who was assassinated in 1995.

ANSWER—(Yitzhak Rabin)

**12.**

**BONUS SOCIAL STUDIES**

Identify the following gulfs from a description.

1. The largest gulf in the world, the Mississippi and Rio Grande Rivers empty into this body of water.

2. An arm of the Pacific Ocean, this gulf is located between mainland Mexico and the Baja peninsula.

3. Lying between Estonia and Latvia, this gulf named after the capital of Latvia is an arm of the Baltic Sea.

4. Emptying into the Ionian Sea, this Greek bay forms the northern boundary of the Peloponnesian peninsula and is named after one of the major cities in the area.

ANSWER—1. (Gulf of Mexico)      2. (Gulf of California)      3. (Gulf of Finland)  
4. (Gulf of Corinth)

## Half-Time

**13.**

**TOSS-UP MATH**

What is the simplest result expressed as an improper fraction when  $5/6$  is added to  $4/7$ , and then the result is divided by 2.

ANSWER—(59/84)

**13.**

**BONUS MATH**

Perform the indicated operations on the following fractions.

1. The quantity  $1/2$  plus  $3/4$  quantity closed divided by  $2/3$ .

2. The quantity  $7/8$  minus  $3/5$  quantity closed times  $4/7$ .

3. The quantity  $9/11$  plus  $5/12$  quantity closed times  $3/2$ .

4. The quantity  $3/4$  minus  $8/9$  quantity closed divided by  $4/9$ .

ANSWER—1. (15/8)      2. (11/70)      3. (163/88)      4. (Negative 5 over 16)

**14.**

**TOSS-UP FINE ARTS**

This 1656 painting shows the five-year-old Infanta Margarita and on either side of her are her ladies-in-waiting. There is a self-portrait of the artist on the left of the picture who is seen in the act of painting a canvas that is so large that it can only be this very one. In the back of the work are identifiable works by Rubens and there is a reflection of the King Philip IV and his wife in a mirror. For ten points name this tremendous work by Diego Velazquez which is located in the Prado.

**ANSWER—**(Las Meninas or the Maids of Honor or the Ladies in Waiting or Portrait of the Family)

**14.**

**BONUS FINE ARTS**

The upper part of an architectural order is known as the entablature. It is divided into three major parts, name them.

**ANSWER—**1, 2 & 3.(Frieze, Architrave & Cornice)

**15.**

**TOSS-UP SCIENCE**

Accidentally created in 1930 by a team of Du Pont chemists under Wallace Carothers, it was considered useless until team member Julian Hill began to play with it and found that it could be drawn into silky fibers. For ten points name this common polyamide fiber which received the first two letters of its name, ny, because it was introduced at the New York World's Fair.

**ANSWER—**(Nylon)

**15.**

**BONUS SCIENCE**

Identify the following elements which have interesting properties at certain temperatures.

1. When existing below .3 degrees Kelvin and at 32 atmospheres of pressure, the number three isotope of this noble gas is the only known substance which has to be heated to change it from a liquid to a solid.
2. Water and this element with atomic symbol Bi are a couple of the few substances whose solid phase will actually float in the liquid.
3. This form of water exhibits at least ten different forms when it is subjected to various temperatures and pressures.
4. One of the few substances to exhibit semipermeability, this metal symbolized Pd allows hydrogen to pass through it.

**ANSWER—**1.(Helium) 2.(Bismuth) 3.(Ice) 4.(Palladium)

**16.**

**TOSS-UP SOCIAL STUDIES**

"In light of the enemy capability to launch a massive ground offensive, U.S. air support operations, including use of atomic weapons, will be employed to inflict maximum destruction of enemy forces," so read a recently declassified memo. For ten points what North Korean ally was the US prepared to use atomic weapons against if they broke the Korean truce agreement.

**ANSWER—**(China)

16.

**BONUS SOCIAL STUDIES**

Answer the following questions about the Jacobite rebellion of 1745-6.

1. The rebellion was an attempt to restore this British dynasty that included James I and Charles II which had been overthrown in the Glorious Revolution of 1688.
2. In July of 1745 the French ship Du Teillay landed this man known as the Young Pretender in Great Britain where he declared that he was restoring his father, James III, to the throne.
3. The Young Pretender was landed in this northern part of Great Britain, gathered a small army among the local highland clans and defeated the English at Preston Pans and Falkirk.
4. In April of 1746 the rebellion was defeated when the English under 'Butcher' Cumberland met and defeated the revolting army at this battle.

ANSWER—1. (Stuarts)      2. (Bonnie Prince Charlie or Charles Edward Stuart)      3. (Scotland)  
4. (Culloden Moor)

17.

**TOSS-UP LITERATURE**

Her work is known for its irreverent humor and intense Catholicism. Her characters are religious fanatics who try to prove God's existence by acts of violence. She wrote Good Country People and The Violent Bear It Away but is more famous for the work Everything that Rises Must Converge. For ten points name this author who wrote A Good Man is Hard to Find.

ANSWER—(Mary Flannery O'Connor)

17.

**BONUS LITERATURE**

1. Identify the author of the Theban trilogy.
- 2, 3 and 4. Name the three works in the trilogy.

ANSWER—1. (Sophocles)      2, 3 + 4. (Oedipus Rex or Oedipus the King, Oedipus at Colonus and Antigone)

18.

**TOSS-UP MATH**

What term in plane geometry denotes the largest circle which can be formed by passing a plane through a sphere?

ANSWER—(Great circle)

18.

**BONUS MATH**

Calculate the volumes of the following figures.

1. The volume of a right circular cylinder with a height of 8 meters and radii of the bases of 4 meters.
2. The volume of a right circular cone with a height of 13 meters and a radius of the base of 9 meters.
3. The volume of sphere with a surface area of 256 Pi square meters.
4. The volume of a cubed with a total surface area of 726 square meters.

ANSWER—1. (128 Pi cubic meters)      2. (351 Pi cubic meters)      3. (2048/3 Pi cubic meters)  
4. (1331 cubic meters)

19.

**TOSS-UP LITERATURE**

Set in Green Town, IL, this novel tells the story of a carnival owned by Cooger and Dark. Two boys, Jim and Will, are unnerved by the arrival of the carnival, but sneak into it anyway. Inside they learn that Cooger and Darl are evil spirits who are trying to destroy the town. The carnival, which lives on the bad will of men, is destroyed by the laughter of Jim and Will. For ten points name this Ray Bradbury novel which takes its title from a line in Shakespeare's Macbeth.

ANSWER—(Something Wicked This Way Comes)

19.

**BONUS LITERATURE**

Identify the following about Ivanhoe.

1. Name the author.
2. The woman who Ivanhoe loves.
3. The name of Ivanhoe's father.
4. The king of England at the time of the story.

ANSWER—1.(Sir Walter Scott) 2.(Lady Rowena) 3.(Sir Cedric) 4.(Richard I)

20.

**TOSS-UP MATH**

What is the solution to the inequality 2 times the quantity 2 minus X quantity closed plus 1 is greater than 5 minus 2X?

ANSWER—(Empty set or null set)

20.

**BONUS MATH**

Find the geometric mean in simplest terms between the following numbers.

1. 8 and 32.
2. 16 and 24.
3. 24 and 32.
4. 8 and 12.

ANSWER—1.(16) 2.(8 times the square root of 6) 3.(16 times the square root of 3)  
4.(4 times the square root of 6)

21.

**TOSS-UP MISCELLANEOUS**

The first man to serve in this position was Omar Bradley in 1949. The majority of the people to fill this post have been from the US Army, although all three major branches of service have been represented. For ten points name this position which has been held by William Crowe, Jr. and Colin Powell.

ANSWER—(Chairman of the Joint Chiefs of Staff)

21.

**BONUS MISCELLANEOUS**

Given the invention, name the inventor.

1. Astronomical telescope.
2. Bifocal lenses.
3. Elevator.
4. Vulcanization of rubber.

ANSWER—1.(Galileo or Hans Lippershey) 2.(Benjamin Franklin) 3.(William Otis)  
4.(Charles Goodyear)

22.

**TOSS-UP SCIENCE**

This electrical law has the same mathematical structure as Fourier's [FOOR-e-a's] law of heat transfer and Fick's law of diffusion. For ten points name this law developed by a German scientist which states that voltage is equal to current times resistance.

ANSWER—(Ohm's law)

22.

**BONUS SCIENCE**

Identify the following minerals which are found on Moh's hardness scale.

1. Also known as steatite or soapstone, this mineral with a hardness of one is a hydrous magnesium silicate which is often used as a powder in cosmetics.
2. The crystalline form of silicon dioxide, this mineral with hardness seven is known as rock crystal when it is colorless.
3. Number eight on the scale, this aluminum silicate gemstone is usually yellow but can be blue or colorless.
4. Number ten on the scale, this hardest of the minerals is an allotrope of carbon.

ANSWER—1.(Talc) 2.(Quartz) 3.(Topaz) 4.(Diamond)



**23.**

**TOSS-UP LITERATURE**

She studied music in New York before turning to writing. Her novels are filled with characters that try to find happiness but instead find nothing but loneliness. She became famous for her play The Square Root of Wonderful and her novel Clock Without Hands. For ten points name this author who wrote The Heart is a Lonely Hunter.

ANSWER—(Carson McCullers)

**23.**

**BONUS LITERATURE**

Given a title, name the author.

1. Songs of Innocence.

2. Inside the Third Reich.

3. The Battle of the Books.

4. Answered Prayers.

ANSWER—1.(William Blake)    2.(Albert Speer)    3.(Jonathan Swift)    4.(Truman Capote)

**24.**

**TOSS-UP SOCIAL STUDIES**

In the days of Eliot Ness when they were known as the Bureau of Prohibition, they were heroes. Now under Director John Magaw their troubles with the standoff at Ruby Ridge with Randy Weaver and David Koresh at Waco and have brought up the idea of eliminating them. For ten points name this law enforcement agency.

ANSWER—(ATF or Alcohol, Tobacco and Firearms)

**24.**

**BONUS SOCIAL STUDIES**

Identify the following states from a list of some of their counties.

1. Dade, Okeechobee and Manatee.

2. Yuma, Cochise and Navajo.

3. Bienville, Acadia and Terrebonne.

4. King William, Spotsylvania and Rappahannock.

ANSWER—1.(Florida)    2.(Arizona)    3.(Louisiana)    4.(Virginia)

## *Replacement Questions*

**TOSS-UP MATH**

What is the decimal equivalent of the Roman Numeral CXXIII?

ANSWER—(123)

**BONUS MATH**

Identify the following geometric terms from a description.

1. This is the name given to a statement which is formed when both parts of a conditional are negated.

2. This is the name given to a closed figure with segments as sides.

3. This is a composition of two reflections over two intersection lines.

4. This is a statement in the form of if and only if.

ANSWER—1.(Inverse)    2.(Polygon)    3.(Rotation)    4.(Biconditional)

**TOSS-UP MISCELLANEOUS**

For ten points the US Davis Cup team began a defense of their title by defeating what country 5-0 in February 1996.

ANSWER—(Mexico)

**BONUS MISCELLANEOUS**

Name the first four teams to win the Super Bowl

ANSWER—(Green Bay Packers, N.Y. Jets, K.C. Chiefs and Baltimore Colts)

**TOSS-UP SOCIAL STUDIES**

His nephew, Edward Bernays, founded the first public-relations consulting firm in the US, while his daughter, Anna, was one of the founders of child psychology. For ten points name this Austrian who himself founded psychoanalysis and who devised the concept of the id, ego and superego.

**ANSWER—(Sigmund Freud)**

**BONUS SOCIAL STUDIES**

Given a year and a political party, tell where the party held their convention that year.

1. 1996, Republican.
2. 1996, Democrat.
3. 1992, Republican.
4. 1992, Democrat.

**ANSWER—1.(San Diego) 2.(Chicago) 3.(Houston) 4.(New York City)**

**TOSS-UP LITERATURE**

Glaucus, Ione, Apaecides, Arabaces, and Nydia are all characters in this work of historical fiction written by Edward Bulwer-Lytton. The action takes place in 79 AD and recounts the lives of these characters before a famous natural disaster takes place. For ten points name this story which takes place in Italy.

**ANSWER—(The Last Days of Pompeii)**

**BONUS LITERATURE**

Identify the following about the book The Wizard of Oz.

1. Name the author.
2. The city in Oz to which Dorothy travels.
3. The color of the slippers the good witch gives Dorothy.
4. The name of the good Witch of the South.

**ANSWER—1.(L. Frank Baum) 2.(Emerald City) 3.(Silver) 4.(Glinda)**