

Illinois High School Association

2009-2010

Scholastic Bowl State Series

Regional Replacements

Replacement/Tie Breaker Question Set

1. If a question needs to be thrown out, replace the discarded question with the first question from the Replacement/Tie Breaker Set that is of the same general category as the discarded question. If a similar-category question is not available, use the first available question in the Replacement/Tiebreaker Set.
2. The Replacement/Tie Breaker questions were collated in a random order. In the event of a tie at the end of regulation play, use the first available toss-up question and the first available bonus question in the order they are printed.
3. Moderators must meet between rounds to update information on which replacement questions were used and should therefore be eliminated from the pool of available questions in the Replacement/Tie Breaker Question Set.
4. As a last resort, a moderator may choose to use an un-read bonus question from the Question Set used in the round that is tied, adapting the Bonus to Toss-up format when necessary.

Notation Guide to Moderators

The following styles and notations were used to facilitate the oral presentation of the questions, even though the style might not follow "correct English" at all times.

1. Commas not usually considered grammatically necessary are often used to facilitate the oral presentation of the questions.
2. Helps for reading, such as pronunciation guides, and directions relative to interpreting answers are in *[bracketed italics]*.
3. Titles of all types in questions are underlined.
4. Other than dates, numbers within questions are presented in prose form to standardize their reading.
5. **Boxed** reference material, such as math work, is provided in case an answer is challenged. It is not necessary to refer to references unless an answer is challenged.
6. Only the **bold** words in answers are required. All non-bold words are optional. Plural forms are ordinarily accepted as correct, even if not indicated as such in bold letters.

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REGIONAL REPLACEMENTS

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Toss Up #1 Mathematics: Geometry, Trig and Analytic Geometry – 10 seconds

Classify triangle ABC based on the following description. ABC is a non-equilateral acute triangle. If X is on segment BC, and if segment AX not only bisects angle A, but is also the perpendicular bisector of segment BC, what type of triangle is triangle ABC?

Answer: **isosceles**

Toss Up #2 Science: Biology

The IUPAC [*eye-you-pak*] name of this amino acid is S-two-amino-four-methylsulfanyl [*meth-ul-SUL-fuh-nol*] butanoic [*byou-tuh-NOY-ik*] acid. This amino acid and tryptophan [*TRIP-toh-fan*] are the only two amino acids with a single RNA codon [*KOH-dun*]. This amino acid and cysteine [*SIGH-tuh-seen*] are the only two amino acids to contain a sulfur atom. This amino acid has the RNA codon: A-U-G. Name the amino acid whose genetic code is the start codon [*KOH-dun*] for all eukaryotic [*yew-KARE-ee-OT-ik*] proteins.

Answer: **methionine** [*muh-THIGH-uh-nine*]

Toss Up #3 Language Arts: British Literature

[NOTE: The awkward wording is the result of a segmented quote with selected words deleted or replaced. We suggest the moderator use pauses and voice tone-changes to convey the meaning.]

Name this work, dedicated to R. Hamilton Bruce, that reflects the author's hope to save his remaining leg from amputation. It was written while the author was hospitalized, and was published in the collection Echoes. The speaker of this poem is proud to "have not winced nor cried aloud," and is sure that, "the menace of the years / Finds and shall find," him "unafraid" as he emerges "Out of the night that covers" him, "Black as the pit from pole to pole." The title is from the Latin for "unconquerable." Name this poem by William Ernest Henley that concludes "I am the master of my fate: / I am the captain of my soul."

Answer: **Invictus**

Toss Up #4 Fine Arts: Art History

A predecessor to this work featured two lovers in the foreground, but it was different in that it was a depiction of the titular entity over the Rhone River. This work depicts the Alpilles [*ahl-PEE-yuh*] mountain range in its upper right, while its foreground features the tops of two cypress trees. A church spire is prominent in the background and it depicts a view from outside of the artist's room in a sanitarium in Saint-Rémy [*SAN ray-MEE*]. Identify this painting of a nocturnal cityscape by van Gogh.

Answer: [*Accept either.*]

The Starry Night

De Sterrennacht

Toss Up #5 Social Studies: Geography

It was designed by Irving Morrow, Charles Alton Ellis, and Joseph Strauss. In 1932, Amadeo [*ah-mah-DAY-oh*] Giannini [*jee-ah-NEE-nee*], the founder of Bank of America, bought the bonds to start its construction. Only twenty-six people have survived a jump from it. There are suicide prevention hotline telephones all along its two point seven five mile length. Due to local fog conditions, Morrow chose to paint this structure in international orange. Name the bridge that connects Marin County to the city of San Francisco.

Answer: **Golden Gate Bridge**

Toss Up #6 Miscellaneous: Technology

Launched in 1998, this company is best known for a network of sixty-six communication satellites that covers the entire earth, transmitting voice and data messages via handheld satellite phones. Identify this company, which derived its name from a transition element of the platinum family.

Answer: **Iridium Communications Incorporated**

Toss Up #7 Language Arts: Grammar and Usage

Because these adjectives build their meaning in one particular order within a sentence, they are not separated by a comma. For example, "Jack wore his black basketball shoes" would not make sense if the adjectives were re-ordered. What term describes such adjectives?

Answer: **cumulative** adjectives

Toss Up #8 Mathematics: General Math – 30 seconds

[NOTE: Each "I" is to be read "eye" – there are no "ones" in the question.]

Spell out the letters in the Roman numeral that states the value of Z, if Z equals the Roman numeral fraction, the quantity MCCXVI plus CII, over the quantity, DCLX minus I.

Answer: **II** [*eye eye*]

$$\text{Work: } Z = \frac{\text{MCCXVI} + \text{CII}}{\text{DCLX} - \text{I}} = \frac{1216 + 102}{660 - 1} = \frac{1318}{259} = 2 = \text{II}$$

Toss Up #9 Fine Arts: Opera

This opera by Wagner [*VAHG-ner*] contains a reference to another of Wagner's works, Tristan und Isolde. If you count the Ring Cycle as four operas, then this opera is Wagner's longest. Its protagonist, Walther von Stolzing, must join a guild in order to win the hand of his beloved in marriage. Name this opera named for the guild and the Imperial German City in which the characters reside.

Answer: [*Accept either.*]

The Master-singers of Nuremberg

Die Meistersinger von Nürnberg

Toss Up #10 Social Studies: U.S. History

After he had been forced into bankruptcy, California belatedly granted this German immigrant a monthly pension of two hundred fifty dollars for his services in settling the state, but his claim for compensation by the federal government for lands he lost to squatters was never acknowledged. Workers hired by this man and his partner, James Wilson Marshall, for a building project made a discovery that changed the history of California. Name the man on whose property the 1848 gold strike occurred.

Answer: John Augustus Sutter

Toss Up #11 Science: Physics

Doppler shift in this type of wave arises from relativistic time dilation, and specific types of these include Alfvén and S-waves. These can be modeled by sine or cosine functions and their sums, and polarization is possible on waves only of this type. They have displacement perpendicular to the direction of propagation. Name this type of wave exemplified by light and contrasted with longitudinal waves.

Answer: transverse waves [Accept variations of *transverse*.]

Bonus #1 Language Arts: U.S. Literature – 4 parts

Answer these about an author and his works.

1. The Escapist was a comic book created by the titular pair of this 2000 Pulitzer Prize-winning novel.
2. Grady Tripp, a professor and writer, and James Leer are the protagonists of this 1995 novel.
3. A recent work by this same author is set in Alaska but in an alternate universe. Meyer Landsman is a detective investigating a series of murders. Name the work.
4. Name the author of these works.

Answers: 1. The Amazing Adventures of Kavalier and Clay
2. Wonder Boys
3. The Yiddish Policeman's Union
4. Michael Chabon

REGIONAL REPLACEMENTS

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Bonus #8 Mathematics: Geometry, Trig and Analytic Geometry – 4 parts

Assume the terms “point,” “line,” and “plane” are used as they are commonly understood in spherical geometry.

1. Two lines intersect in exactly how many points?
2. What shape is used to represent the shortest distance between any two points?
3. What name is given to a closed figure with only two sides?
4. The degree sum of the angles of a spherical triangle must be between what two numbers?

Reference: A “plane” is equivalent to a “sphere” and a “line” is equivalent to a “great circle.”

Answers: 1. **two points**

2. **arc of a great circle** [*Prompt arc; “great circle” is wrong.*]

3. **lune**

4. [*Be reasonable, but do not prompt an incomplete answer.*]
between **180 degrees** and **540 degrees**

Bonus #9 Language Arts: Spelling – 4 parts

Spell these words related to foods.

1. chutney [*CHUT-nee*] – a jam-like condiment
2. cruller [*KRUH-ler*] – a sweet pastry
3. croquette [*kroh-KETT*] – a deep fried ball of meat or vegetable
4. cilantro [*suh-LAHN-tro*] – a garnish

Answers: 1. **CHUTNEY**

2. **CRULLER**

3. **CROQUETTE**

4. **CILANTRO**

} [*Upper case is irrelevant.*]

Bonus #10 Fine Arts: Art History – 4 parts

Identify the following about Roman architecture.

1. The Romans were able to build curved elements like arches due to the advent of this material, which is made up mostly of gravel, sand, and cement.
2. This complex, located in the Palatine and Capitoline hills, featured a gate for Janus.
3. This structure’s dome has the same diameter as height. The dome features hollow elements, and its thickness decreases as it rises towards the oculus [*OK-you-lus*].
4. The construction of this structure was begun by Caesar Vespasianus Augustus. It was capable of seating up to fifty thousand spectators.

Answers: 1. Roman **concrete** [*“Cement” is wrong.*]

2. the **Forum**

3. the **Pantheon**

4. the **Coliseum**

Bonus #11 Science: Physics – 4 parts

Answer these about pendulums.

1. It is the maximum displacement of the pendulum during its swing.
2. Pendulums of a given length have a constant value of this property, which is equal to two pi times the square root of the rod's length, over, the acceleration due to gravity. I need a one-word answer.
3. If air resistance and the mass of the rod are neglected, pendulums swinging through small angles approximate this type of movement, the solution to a second-order differential equation.
4. The small-angle simplification assumption works because it lets sine theta equal theta, where theta is the angle of displacement – a simplification that follows from this calculus result about the sinc function.

- Answers:
1. **amplitude**
 2. *[Accept either.]*
period **frequency**
 3. **simple harmonic** motion *[Prompt an incomplete answer.]*
 4. *[Accept either. Prompt on "the first term of its Taylor series"]*
the first term of its **Taylor** series **about** theta equals **zero**
the first term of its **Maclaurin** series