





## Scholastic Bowl State Series



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### SPECIAL INSTRUCTIONS FOR MODERATORS

- 1) The Moderators are to review all rounds of the questions and answers during their Moderators' Meetings.
- 2) The Moderators may make corrections, changes, deletions, additions and notes in the margins, provided a majority of the Moderators present agree to such items.
- 3) Please be sure to note any corrections, changes, deletions, additions and notes on the questions in a packet.
- 4) **NO ADDITIONS, DELETIONS, CORRECTIONS, CHANGES OR NOTES MAY BE ADDED AFTER THE MODERATORS' MEETING -- EXCEPT THAT A MODERATOR MAY MAKE A DECISION REGARDING A QUESTION AND ANSWER IN REGARD TO A LEGITIMATE PROTEST THAT MIGHT ARISE DURING THE MATCH.**
- 5) During the match, the Moderator is to draw a pencil mark (/) through each question that is used in the match.
- 6) Immediately after the match is over, the Moderator is to return the questions to the Principal or Sectional Manager. At the State Final the questions must be returned to IHSA personnel working the meet.

# Illinois High School Association

2009-2010

## Scholastic Bowl State Series

### Regional (3)

#### ROUND 3

THREE---THREE---THREE---THREE---THREE

#### 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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Toss Up #1 Social Studies: U.S. History

She represented Maine in the U.S. Congress from 1940 until 1948, when she was elected to the U.S. Senate, thus becoming the first woman elected to both houses of Congress. At the 1964 Republican National Convention, she became the first woman to have her name placed in nomination by a major party. Name her.

Answer: Margaret Chase **Smith**

Bonus #1 Language Arts: Mythology – 4 parts

Name the following swords.

1. This was the sword of Sigurd.
2. One of the three imperial regalia of Japan, this sword was found by Susano.
3. Beowulf attempted to use this sword to kill Grendel's mother.
4. This "Sword of Mercy," or "Edward the Confessor's Sword," has its blade broken off short and square. It is part of the Crown Jewels of the United Kingdom and is also said to be the sword of Ogier the Dane.

- Answers:
1. **Gram**
  2. **Kusanagi-no-Tsurugi** [*koo-sih-NAHG-ee*]
  3. **Hrunting** [*HROON-ting*]
  4. [*Accept either.*]  
**Curtana**  
**Cortana**

Toss Up #2

Mathematics: Algebra and Pre-calculus – 30 seconds

List all of the real roots for X, if any exist, of the following equation: X cubed plus one hundred twenty-five equals zero.

Answer:  $x = -5$  [Leading "x =" is optional.]

Notation: $x^3 + 125 = 0$
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Bonus #2 Science: Biology – 4 parts

Identify the geologic period associated with the fossil records of these organisms.

1. Crocodile and Brachiosaurus
2. Trilobite and Orsten fauna
3. Tyrannosaurus Rex and Velociraptor
4. Homo Sapiens and Pan Troglodyte [*TROG-luh-dite*]

Answers:

1. **Jurassic** Period
2. **Cambrian** Period
3. **Cretaceous** Period
4. **Quaternary** Period

Toss Up #3 Language Arts: World Literature

This form of novel originated in Spain with the first-person narrative by a servant named Lázaro [lah-ZAH-roh]. The first novel of this form in England was Thomas Nashe's The Unfortunate Traveler. What is this form of novel that derives its name from the Spanish word for "rogue"?

Answer: **picaresque** novel [LISTEN "picturesque" is wrong.]

Reference: the Spanish word is "pícaro"

Bonus #3 Mathematics: Combinatorics, Probability and Statistics – 5 parts

Answer these combinatorics questions.

1. In how many distinct ways can eight people be seated around a circular table?
2. In how many ways can seven keys be arranged on a key ring?
3. How many different six-digit whole numbers can be created from the first six counting numbers if each of the counting numbers is used exactly once in each whole number formed?
4. In how many ways can eight people be seated in a row of five chairs?
5. What term is used to describe the type of permutation illustrated by part two of this question?

- Answers:
1. **5040** ways
  2. **360** ways
  3. **720** ways
  4. **6720** ways
  5. **circular** permutation

Notation/Work

1.  $(8-1)!$

2.  $\frac{(7-1)!}{2}$

3.  $6! \rightarrow 0$  is not a counting number

4.  ${}_8P_5 = \frac{8!}{(8-5)!}$

Toss Up #4 Science: Physics

The Eddington limit is the balancing point between radiation pressure and this force, which, in mathematics, leads to the brachistochrone [*brah-KIS-toh-krohn*] problem and is used to define the shape of a catenary [*KAT-uh-nare-ee*]. Its namesake constant, measured in newton-meters squared per kilogram squared, is on the order of ten to the negative eleven. Name this fundamental force of nature studied by Isaac Newton that is only attractive.

Answer: universal **gravity** [*Accept variations of gravity.*]

Bonus #4 Social Studies: World History – 4 parts

Answer the following questions regarding French colonial wars.

1. The French defeat at the village of Dien Bien Phu [*dyen ben FOO*] resulted in the independence of this colonial possession, which was divided into two countries. Name the colonial possession, not the two countries.
2. This leader of the rebel movement, who fought French forces at Dien Bien Phu [*dyen ben FOO*], arrived at the Geneva peace conference the day after the village fell.
3. Guerilla warfare in this African colony began in 1954 and lasted until 1962, and included terrorist bombs set off in the city of Algiers.
4. Continued tension regarding the colonial war in Africa led to this man's return to political power in 1958.

- Answers:
1. **Vietnam**
  2. [*Accept any of these*]  
**Ho Chi Minh** [*Prompt an incomplete answer.*]  
**Nguyen Sinh Cung**  
**Nguyen Ái Quoc**
  3. **Algeria**
  4. **Charles de Gaulle**

Toss Up #5 Miscellaneous: Interdisciplinary

*[NOTE: The awkward wording is the result of a segmented quote with the answer deleted. We suggest the moderator use voice tone-changes to convey the meaning.]*

For a short time, the Teenage Mutant Ninja Turtles had a sister by this name. The Marvel Comics character with this name took the human identity Vicki Starr. A painting by Diego Velázquez [*vuh-LASS-kwez*] titled The Rokeby “this word” depicts a nude woman lying on a bed looking into a mirror held by a cherub. A mythological character by this name was the mother of Aeneas as well as the lover of Adonis. Name the Roman goddess of love and the second planet from the Sun.

Answer: **Venus** [*Accept “Venus de Milo” until “Marvel Comics character”*]

Reference: The Rokeby Venus

Bonus #5 Science: Chemistry – 5 parts

For each of the following elements, provide its atomic symbol which was derived from a language other than English.

1. silver
2. tungsten
3. mercury
4. potassium
5. antimony [*ANN-tih-moh-nee*]

Answers:    1. **Ag**  
                  2. **W**  
                  3. **Hg**  
                  4. **K**  
                  5. **Sb**    } [*Upper/lower case need not be specified.*]



Toss Up #6 Mathematics: Algebra and Pre-calculus – 30 seconds

Solve for X. Given: the greatest common factor of eight X and twelve, equals, the positive square root of X.

Answer:  $x = 16$  [Leading “x equals” is optional.]

Work: $GCF(8x, 12) = 4 \rightarrow 4 = \sqrt{x}$
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Bonus #6 Fine Arts: Classical Music History – 4 parts

From 1856 to 1879, five Russian composers met regularly in St Petersburg. Name the member of “The Five” credited with each of these works.

1. the symphonic poem In the Steppes of Central Asia
2. the piano suite Pictures at an Exhibition
3. the song with orchestral accompaniment, Bolero, Opus Seventeen
4. the symphony subtitled Antar

Answers: 1. Alexander Porfirievich **Borodin**  
2. Modest Petrovich **Mussorgsky**  
3. César Antonovich **Cui** [KYOO-ee]  
4. Nikolai Andreyevich **Rimsky-Korsakov**

Toss Up #7 Fine Arts: Art History

This man painted a black-and-white tiled floor and a girl playing piano in The Music Lesson. In addition to A Girl Asleep and Officer and Laughing Girl, he painted a girl in a yellow dalmatian fur robe at her desk, as well as a man in a blue robe bending over a map. In addition to A Lady Writing, The Astronomer, and The Geographer, he allegorically showed an artist painting a girl holding a trumpet in The Art of Painting. Name this Baroque Dutchman who painted View of Delft and a girl in yellow and blue wearing the titular jewelry in Girl with a Pearl Earring.

Answer: Jan/Johannes/Johan Vermeer

Bonus #7 Social Studies: World History – 4 parts

Answer these about South Africa under apartheid.

1. This outspoken opponent of apartheid won the Nobel Peace prize in 1984 and later became the first black Anglican archbishop of Cape Town.
2. A 1976 uprising in this black township outside of Johannesburg was a turning point in the struggle of black South Africans against apartheid.
3. Nelson Mandela spent eighteen years on this prison island off the coast of Cape Town.
4. This man was the last president of apartheid-era South Africa.

Answers: 1. Desmond Tutu  
2. Soweto Township  
3. Robben Island  
4. Frederik Willem de Klerk

Toss Up #8 Science: Health

This obstetric condition can be categorized as frank, footling, kneeling, or complete. Some of the biggest risks to the baby include the head's inability to pass through the cervix because dilation is not complete, and the compression of the umbilical cord. It most commonly occurs with babies who are born prematurely, because growth after the thirty-second week of gestation usually forces the baby into an inverted position. What term describes a fetus whose head is above its feet when the fetus exits the birth canal?

Answer: **breech** birth/delivery/baby

Bonus #8 Mathematics: Algebra and Pre-calculus – 5 parts

Give the common name of each of these sequences whose first few terms I will read.

1. one, one-half, one-third, one-fourth, one-fifth, one-sixth, etc.
2. one, one, two, three, five, eight, thirteen, twenty-one, etc.
3. two, one, three, four, seven, eleven, eighteen, twenty-nine, etc.
4. one, three, six, ten, fifteen, twenty-one, twenty-eight, thirty-six, etc.
5. one example is this complete five-term sequence: zero, one-third, one-half, two-thirds, one

- Answers:
1. **Harmonic** sequence
  2. **Fibonacci** numbers
  3. **Lucas** numbers
  4. **Triangular** numbers
  5. **Farey** sequence

Toss Up #9 Language Arts: U.S. Literature

The author's original intentions were to keep this character single, but due to the volume of fan mail in favor of the character's marriage, the author gave in to her ardent fans. The character was originally employed as a companion to her aunt, but returned home when her sister Beth became sick. She cut her hair to pay for her mother's visit to her sick father. She married Fritz after turning down Laurie's marriage proposal. Name the second eldest daughter of the March family from Little Women.

Answer: **Jo March**

Bonus #9 Miscellaneous: Pop Culture – 4 parts

Identify these Nicktoons.

1. One of the three original Nicktoons, this show featured a dimwitted manx cat and a loud, psychotic chihuahua as well as the song Happy Happy Joy Joy.
2. Another of the original Nicktoons, it featured, among others, Tommy Pickles and Chuckie Finster, who often clashed with Tommy's cousin, Angelica.
3. This show saw Flea of the Red Hot Chili Peppers lend his voice to Donnie, a feral boy who was adopted by a family of traveling wildlife documentarians.
4. Created by former marine biologist Stephen Hillenburg, the main character's neighbor lives in a moai [*moh-I*], and another character lives in a sort of bio-dome with a large oak tree.

- Answers:
1. The Ren and Stimpy Show
  2. Rugrats
  3. The Wild Thornberrys
  4. SpongeBob SquarePants

Toss Up #10 Social Studies: Psychology and Sociology

In 1911, he split with Freud to form his own group, taking several members of the Freudian school with him. The following year he published The Neurotic Constitution in which he formally introduced the term “individual psychology.” His contributions include the importance of birth order in the formation of personality and the idea that one must study and treat the patient as a “whole person.” Name the Austrian psychologist and author of The Practice and Theory of Individual Psychology.

Answer: Alfred Adler

Bonus #10 Mathematics: Geometry, Trig and Analytic Geometry – 5 parts

Answer these about a rectangular coordinate system in three-dimensional space.

1. What term is the three-dimensional equivalent of the word “quadrant”?
2. Fill in the BLANK in this definition: A line in which a plane intersects a coordinate plane is called the BLANK of the given plane in that coordinate plane.
3. Points in the first quadrant-equivalent you named in part one, are identified by the triplet, “plus plus plus”. Give the triplet for the quadrant-equivalent bounded in part by the negative X-axis, the negative Y-axis, and the positive Z-axis.
4. Traditionally, which axis is drawn on paper to represent the three-space vertical direction?
5. In order to give spatial perspective to a three-dimensional coordinate system on a piece of paper, instead of a ninety degree angle, what size angle is drawn between the positive X and positive Y axes?

Answers: 1. **octant**

2. **trace**

3. **minus minus plus octant** { [#3: Three required words - do not prompt an incomplete answer.]

4. **Z-axis**

5. **135 degrees**

Toss Up #11 Science: Biology

Meaning “shaggy hairs” in Latin, these structures found in the small intestine appear as tiny, finger-like projections from the intestinal wall, and are full of capillaries. Name these structures that help deliver enzymes into the small intestine and absorb nutrients into the bloodstream.

Answer: *[Accept either.]*  
**villi** [*VIL-lie*]  
**villus** [*VILL-us*]

Bonus #11 Social Studies: Philosophy and Political Science – 4 parts

Answer these about John Locke.

1. John Locke believed that the human mind began life as this two-word term.
2. Locke’s opinion on the mind was expressed in this epistemological work.
3. He also wrote two works about political philosophy which showed his willingness to condone revolution under the right circumstances. Give the collective name for these works.
4. Locke also wrote this epistolary work which advocates freedom of religion for any group of people, except atheists.

Answers: 1. *[Accept either.]*  
**blank slate**  
**tabula rasa**  
2. **Essay Concerning Human Understanding**  
3. **Two Treatises on Government**  
4. **A Letter Concerning Toleration**

Toss Up #12 Fine Arts: Opera

Sarah Bernhardt originated the titular role in the Sardou [sahr-DOO] play upon which this opera is based. Her lover, Cavaradossi, is executed in what was supposed to have been a sham. She then leaps to her death cursing the Baron Scarpia, lately her victim and erstwhile her tormentor. Name the title character of this Puccini opera set in Napoleonic Rome.

Answer: La Tosca

Bonus #12 Language Arts: Speech – 4 parts

Identify these one-word terms related to public speaking.

1. It is a farewell or inspirational speech delivered at a graduation ceremony, usually by the top-ranking student in the class.
2. It is delivered at political or industrial conventions and expositions, and at academic conferences to set the underlying tone and summarize the core message of the event.
3. This payment is made to a guest speaker for his or her services in a volunteer capacity to cover expenses related to travel and accommodations.
4. This term formerly referred to a person in charge of the proceedings of an event. He or she introduced the speakers and kept the event on schedule. Today this person is commonly called the MC.

- Answers:
1. **valedictory**
  2. **keynote** speech/address
  3. **honorarium**
  4. **toastmaster**

Toss Up #13 Social Studies: Current Events

This man, with his wife, had appeared twice on the ABC reality show Wife Swap prior to his most recent brush with fame. In 2008, he participated in a You Tube series about Psyience Detectives – spelled P-S-Y-I-E-N-C-E. The TLC network told CNN that they had passed on a science reality show pitched by this Colorado man. In October, 2009, the nation watched as authorities followed a run-away weather balloon supposedly carrying his son Falcon. Name the father of the so-called “Balloon Boy.”

Answer: Richard **Heene**

Bonus #13 Fine Arts: Art History – 4 parts

Name these paintings that all feature dogs.

1. C.M. Coolidge created sixteen paintings of dogs playing this card game.
2. A small, brown and white dog rests on a bed in this Titian masterpiece that takes its name from the Roman goddess of beauty and depicts a nude woman reclining on her bed.
3. A dog walks by the River Stour [*stur*] in this John Constable work that shows a mill in Suffolk, England.
4. A white dog turns its head away from the title event in this painting, which shows the internment of the great-uncle of the painter, Gustave Courbet.

- Answers:
1. Dogs Playing Poker
  2. [*Accept either.*]  
Venus of Urbino  
Venere di Urbino
  3. The Hay Wain
  4. [*Accept any of these.*]  
A Burial at Ornans  
A Funeral at Ornans  
Un enterrement à Ornans



Toss Up #14 Language Arts: British Literature

This author created Catriona and Weir of Hermiston along with a work in which Ebenezer abducts his nephew David. In another of his novels, Captain Flint faces off against Jim Hawkins, and in perhaps his most famous novel, Inspector Newcomen acts on a tip from a friend of Richard Enfield, Gabriel Utterson, to investigate the murder of Sir Danvers Carew. Name this Scottish author of Kidnapped, Treasure Island, and The Strange Case of Dr. Jekyll and Mr. Hyde.

Answer: Robert Louis **Stevenson**

Bonus #14 Science: Astronomy – 4 parts

Identify these moons of our solar system.

1. Astronomers believe that a layer of liquid water exists beneath the icy bright crust of this smallest of the four Galilean [*gah-luh-LAY-in*] moons.
2. Discovered in 1846, it is the largest moon of its planet. Its retrograde orbit suggests that it may be an object captured from the Kuiper [*KY-per*] belt.
3. Discovered by Kuiper [*KY-per*] in 1948, it is the smallest of the five major Shakespearean moons of its planet. Its surface has an assortment of curious terrains, including a remarkable feature known as the “chevron.”
4. Discovered by Herschel [*HER-shil*] in 1789, it is the sixth largest moon of its planet, just larger than Mimas [*MEE-mass*]. The Cassini [*kah-SEE-nee*] mission discovered a water-rich plume venting from its south polar region.

Answers: 1. **Europa**  
2. **Triton**  
3. **Miranda**  
4. **Enceladus** [*en-suh-LAH-dus*]

Reference

1. 4<sup>th</sup> largest moon of Jupiter
2. largest moon of Neptune
3. 5<sup>th</sup> largest moon of Uranus
4. 6<sup>th</sup> largest moon of Saturn

Toss Up #15 Mathematics: Geometry, Trig and Analytic Geomctry – 10 seconds

This term describes two chords in the same circle that are equidistant from the center of the circle. What term, beginning with the letter “C”, can generally be defined as, superposable so as to be coincident throughout?

Answer: *[Accept anything indicating same length before “letter C.”]*  
**congruent**

Bonus #15 Language Arts: U.S. Literature - 3 parts

Name the Southern authors of these works.

1. All the King’s Men and At Heaven’s Gate
2. Tobacco Road and God’s Little Acre
3. The Optimist’s Daughter and The Delta Wedding

Answers: 1. Robert Penn **Warren**  
2. Erskine **Caldwell**  
3. Eudora **Welty**

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**HALF TIME**  
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Toss Up #16 Fine Arts: Classical Music History

Because of his radical political tendencies and his involvement in the unsuccessful Revolution of 1848 in Germany, this composer fled first to Paris, and then to Zürich. His youthful Symphony in C premiered in Prague in 1832. He was eventually befriended by Ludwig the Second of Bavaria who lavishly supported him. Name the composer of the piece which became the Faust Overture.

Answer: **Wilhelm Richard Wagner** [*probably: VAHG-ner*]

Bonus #16 Science: Biology – 4 parts

Succinyl-CoA [*SUCK-sin-ul koh-A*], succinic [*suk-SIN-ic*] acid, and fumaric [*fyou-MAH-rik*] acid, are three of the nine compounds found in the central circle of the Krebs cycle. Name four of the remaining six, using the names of their acid forms.

Answers: **aconitic acid** [*ak-uh-NID-ik*]  
**citric acid**  
**isocitric acid**  
**ketoglutaric acid** [*kee-toh-glue-TER-ik*]  
**malic acid** [*possibly: MAY-lik; possibly: MAH-lik*]  
**oxaloacetic acid** [*OK-suh-LOH-uh-SEE-tik*]

Toss Up #17 Mathematics: General Math – 30 seconds

*[NOTE: Pause at the commas for clarity.]*

Find the quotient of the following two quantities: the square of the LCM of six and four, and, the cube of the GCF of sixty-six and seventy.

Answer: **18**

Work: $LCM(6,4) = 12$ ; $GCF(66,70) = 2$
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Bonus #17 Language Arts: British Literature – 4 parts

Identify the following about Frankenstein and its author, Mary Shelley.

1. Frankenstein is written in the form of a frame narrative, with Victor Frankenstein relating the story to this naval captain, who in turn writes letters about the story to his sister Margaret.
2. Shelley's mother, Mary Wollstonecraft, penned this seminal work of feminist philosophy in 1792.
3. Shelley was good friends with this poet responsible for Childe Harold's Pilgrimage and Don Juan [*JOO-uhn*], initially conceiving of Frankenstein while spending time at his estate.
4. The subtitle of Frankenstein references this mythological Titan.

- Answers:
1. Captain **Robert Walton** [*Accept either or both.*]
  2. A Vindication of the **Rights of Woman**: with Strictures on Political and Moral Subjects
  3. **George Gordon, Lord Byron** [*Accept either or both.*]
  4. **Prometheus**

Toss Up #18 Social Studies: U.S. History

He chaired the Atomic Energy Commission's General Advisory Committee beginning in 1947, but was later suspended from his advisory role on charges that his past association with Communists made him a poor security risk. After being cleared of all charges, the AEC honored him with the Enrico Fermi Award. Name the man who served as a director of World War Two's Manhattan Project.

Answer: **Julius Robert Oppenheimer**

Bonus #18 Fine Arts: Music Theory – 4 parts

Identify the following that appear in sheet music.

1. This symbol, that looks like a number sign, raises a pitch a half-step.
2. This notation usually appears at the beginning of a score to indicate the meter of the piece, but it is often omitted in recitative passages.
3. Similar to a trill, this ornament comes in upper and lower varieties. It is a single alternation between the principal note and one above or below it.
4. This is an alternate passage usually printed above the main music, and is left to the choice of the musician.

Answers: 1. **sharp**  
2. **time signature**  
3. **mordent**  
4. **ossia**

Toss Up #19 Science: Chemistry

In its gaseous form, it can be condensed to a pale blue liquid that is strongly magnetic. It can be isolated in bulk amounts by either fractional distillation on liquefied air, or by electrolysis of water. Potassium chloride and lead azide [*AZ-ide*] do not have it, but potassium chlorate and lead arsenate do. What element is indicated by the suffix A-T-E in the name of a chemical?

Answer: **oxygen**

Bonus #19 Language Arts: World Literature – 3 parts

Names these plays which share their names with the operas they inspired.

1. The play is the first part of a trilogy written in the 1770's by French author Beaumarchais [*boh-mar-SHAY*]. Its title refers to the profession of one of the characters in the play.
2. This five-act play by Friedrich Schiller is loosely modeled on historical events in the sixteenth century during the reign of King Philip the Second of Spain.
3. This play by Prosper Mérimée [*may-ree-MAY*] was first published in 1845. The title character is a gypsy.

- Answers:
1. [*Accept either.*]  
The Barber of Seville  
Le Barbier de Seville
  2. [*Accept either.*]  
Don Carlos  
Don Karlos, Infant von Spanien
  3. Carmen

Toss Up #20 Fine Arts: Art History

The Propylaea [*proh-PEE-lee-uh*] serves as the gate to this complex, while a building in this complex features six female columns called the Porch of Caryatids [*kare-ee-AH-tids*]. The Erechtheum [*ir-REK-thee-um*] is featured in this group along with two temples that were designed for the patron god of the complex. The Temple of Athena Nike pales in comparison to the main structure of this building, which featured a cult statue designed by Phidias, and from which the Elgin marbles were taken. Name this complex in Athens in which the Parthenon is located.

Answer: **Acropolis**

Bonus #20 Mathematics: Geometry, Trig and Analytic Geometry – 4 parts

Given alpha in standard position through the point, five comma negative twelve.

Find the following. Use a single, simplified, rationalized fraction for each answer.

1. sine of alpha
2. cosine of alpha
3. tangent of alpha
4. secant of alpha

Answers: 1.  $-\frac{12}{13}$   
2.  $\frac{5}{13}$   
3.  $-\frac{12}{5}$   
4.  $\frac{13}{5}$

Reference/Work
$x = 5$ $y = -12$
$r = \sqrt{5^2 + (-12)^2} = 13$

Toss Up #21 Social Studies: World History

This member of the Austrian Hapsburg family was living the life of a distinguished country gentleman when Napoleon the Third asked him to administer one of his overseas possessions. Assured by the French Emperor that the foreign citizens had voted to welcome him as their new ruler, he and his wife set sail for the New World in 1864 to become Emperor and Empress of Mexico. However, Mexican liberals, in addition to many foreign governments, refused to recognize the legitimacy of his rule. Civil war ensued. Name this Emperor of Mexico who was captured and executed by Republican forces in 1867.

Answer: *[Accept either.]*  
**Maximilian I of Mexico**  
**Maximiliano I of Mexico**

Bonus #21 Miscellaneous: Interdisciplinary – 4 parts

Identify these people, places or things that appear on the euro coins of different countries.

1. The Italian two-euro coin features a portrait, taken from a painting by Raphael, of the poet who was responsible for The Divine Comedy. Name the poet.
2. Appearing on the fifty, twenty, and ten-cent euro coins in Germany, this landmark, based on the architecture of the Acropolis, is located in Berlin.
3. The Spanish fifty, twenty, and ten-cent euro coins depict this man, the author of Don Quixote.
4. The Austrian one-euro coin features this man, the composer of a famous Dies Irae [*DEE-ess EE-ray*] movement as well as the opera Così fan tutte [*KOH-zee-fahn TOO-tay*].

Answers: 1. **Dante Alighieri** *[Accept either or both.]*  
2. *[Accept either.]*  
**Brandenburg Gate**  
**Brandenburger Tor**  
3. Miguel de **Cervantes** Saavedra  
4. Johannes Chrysostomus Wolfgangus Theophilus Amadeus **Mozart**



Toss Up #22 Mathematics: Geometry, Trig and Analytic Geometry – 30 seconds

Determine the value of K so that the two given lines will be parallel. Give your answer as an integer or as a single, simplified, rationalized fraction. The first line is: three X minus KY equals seven. The second line is: two X plus five Y equals negative one.

Answer: *[The leading "k equals" is optional.]*

$$k = -\frac{15}{2}$$

Reference/Notation

$$3x - ky = 7 \rightarrow m = \frac{3}{k}$$

$$2x + 5y = -1 \rightarrow m = -\frac{2}{5}$$

Bonus #22 Social Studies: U.S. History – 5 parts

The Duties in American Colonies Act 1765 was passed specifically to raise revenue. The British Parliament repealed it in 1766, yielding more to the demands of British merchants than to colonial objections to taxation.

1. By what name was this legislation commonly known in the Colonies?
2. Who was the British Prime Minister at the time?
3. Name the secret society organized in the colonies to oppose this legislation.
4. The Virginia House of Burgesses passed a series of resolutions against this legislation. Name the man who authored those resolutions.
5. After the legislation was repealed, the society you named in part three organized local chapters to foster resistance to oppressive British economic and political actions. What name was given to these local chapters?

- Answers:
1. **Stamp Act of 1765**
  2. **George Grenville**
  3. **Sons of Liberty**
  4. **Patrick Henry**
  5. **Committees of Correspondence**

Toss Up #23 Science: Biology

Peter Agre was awarded the 2003 Nobel Prize in Chemistry for their discovery. These protein complexes are arranged in six transmembrane alpha-helices. Name the cellular proteins that facilitate the flow of water across the cell membrane.

Answer: **aquaporin**

Bonus #23 Language Arts: British Literature -- 4 parts

Identify the following about D.H. Lawrence.

1. This semi-autobiographical work by Lawrence tells the story of the budding artist Paul Morel and his relationships with Clara, Miriam and his mother.
2. This work focuses on Constance and the title character, Oliver Mellors. The work was repeatedly banned because of its explicit nature.
3. This Lawrence short story is about Paul, a young boy whose method to ensure he knows the winner of a horse race leads to his unfortunate death at the end of the story.
4. Lawrence was particularly close to this British author who penned Brave New World.

- Answers:
1. **Sons and Lovers**
  2. **Lady Chatterly's Lover**
  3. **The Rocking-Horse Winner**
  4. **Aldous Huxley**

Toss Up #24 Language Arts: Grammar and Usage

The case needed by a pronoun that precedes a gerund is often the source of a grammatical error. For example, "We never listen to him singing" is incorrect. What case should be used for a personal pronoun before a gerund?

Answer: **possessive case**

Bonus #24 Social Studies: Government – 4 parts

*[NOTE – DATE SENSITIVE: This information is correct as of January 15, 2010.]*

Most U.S. states have primaries prior to national elections. Five states have closed caucuses, even though two of those states allow voters to switch party affiliations quite easily. Name four of the five states with closed caucuses.

Answers: **Alaska**  
**Iowa**  
**Maine**  
**Nevada**  
**Wyoming**

Toss Up #25 Miscellaneous: Agriculture

A 2001 White Paper by Gary Libecap and Zcynep Hansen suggested that this measure's expansion led to the dust bowl of the 1930s. Its 1976 repeal came long after it had ceased to be meaningful. This law's first applicant was Daniel Freeman, a Nebraskan, who was required to pay a ten dollar fee and a commission to an agent. Its policies eventually distributed a tenth of the land in the United States. Name this 1862 law that applied to those who had never taken up arms against the United States, and required them to improve the one hundred sixty acres of land they were granted.

Answer: **Homestead Act of 1862**

Bonus #25 Mathematics: Algebra and Pre-calculus – 5 parts

Specify the integer coefficient on the given term of these binomial expansions.

1. the quantity, X plus Y, end quantity, to the seventh, for the term including, Y to the seventh
2. the quantity, X plus Y, end quantity, to the sixth, for the term including, X squared Y to the fourth
3. the quantity, X plus Y, end quantity, to the fifth, for the term including, X cubed Y squared
4. the quantity, X plus Y, end quantity, to the fourth, for the term including, X squared Y squared
5. the quantity, X plus Y, end quantity, to the ninth, for the term including, X to the eighth Y

Answers:

1. **1**
2. **15**
3. **10**
4. **6**
5. **9**

Notation/Work

1.  $(x+y)^7 = x^7 + 7x^6y + \dots + 7xy^6 + y^7$
2.  $(x+y)^6 = x^6 + 6x^5y + 15x^4y^2 + 20x^3y^3 + 15x^2y^4 + 6xy^5 + y^6$
3.  $(x+y)^5 = x^5 + 5x^4y + 10x^3y^2 + 10x^2y^3 + 5xy^4 + y^5$
4.  $(x+y)^4 = x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4$
5.  $(x+y)^9 = x^9 + 9x^8y + \dots + 9xy^8 + y^9$

Toss Up #26 Language Arts: Mythology

Name this figure from Greek mythology. Neo-Platonists separate this figure into two separate ones. Ourania represents the body and soul and Pandemos is associated with physical love. The most common version of her origin is as a result of Cronus cutting Ouranios' genitals and casting them into the sea near Cyprus. She was married to the ugliest god Hephaestus who caught her in a golden net with her lover Ares. Name the Greek goddess of love and beauty.

Answer: **Aphrodite**

Bonus #26 Fine Arts: Art History – 4 parts

Identify the following about nineteenth-century American art.

1. This is a painting of Virginie Gautreau in a low-cut black dress, leaning on a table with her right hand, and holding up the folds of her dress with her left. Her face is turned to be in profile.
2. This man is responsible for the work in part one, as well as works such as El Jaleo, The Daughters of Edward Darley Boit, and Carnation, Lily, Lily, Rose.
3. This portrait features a woman sitting, and the artist's Black Lion Wharf hung in the background.
4. This Winslow Homer painting depicts a man in a boat surrounded by multiple sharks as well as what appears to be a waterspout in the background.

- Answers:
1. Portrait of Madame X
  2. John Singer Sargent
  3. *[Accept either.]*  
Arrangement in Grey and Black: The Artist's Mother  
Whistler's Mother
  4. The Gulf Stream

Toss Up #27 Science: Physics

This process can take advantage of the wave nature of electrons to improve transmission electron microscopy, but is most commonly used with electromagnetic waves. These entities differ from more conventional methods of image reproduction in that the entire image is contained within every part of the result. Invented by Dennis Gabor in 1948, this process relies on the interference between an object beam and a reference beam. Types of these entities include Denisyuk [*DEN-iss-yuk*] and rainbow transmission, the latter of which is found on credit cards. Identify this type of stored three-dimensional image produced using laser light.

Answer: **hologram** [*Accept variations such as **holography**.*]

Bonus #27 Social Studies: Geography – 4 parts

Answer these questions about the geography of China.

1. It lies at the mouth of the Yangtze [*yang-tzee*] River and is China's largest city.
2. In 1999, two years after the Chinese regained Hong Kong, they reclaimed this area from Portugal.
3. The Yangtze [*yang-tzee*] is the longest river in China. Name the river that dominates North China and is the second-longest in China.
4. This city, once known as Canton, is the capital of Guangdong [*gwan-DOONG*] province.

- Answers:
1. **Shanghai**
  2. **Macao** [*muh-KOW*]
  3. [*Accept any of these.*]  
**Huang He River**  
**Huang Ho River**  
**Yellow River**
  4. **Guangzhou** [*gwan-JO*]

Toss Up #28 Social Studies: Geography

The northern part of this U.S. state is dominated by the southern end of the Cumberland Plateau. Its rivers include the Coosa [*KOOS-suh*] and the Tallapoosa [*tal-uh-POO-suh*]. The Chattahoochee River forms part of its eastern boundary. Some of its cities include Dothan [*DOH-thun*], Anniston, and Gadsden. Identify this state, known as the Yellowhammer state, that contains the cities of Huntsville, Mobile, Montgomery, and Birmingham.

Answer: **Alabama**

Bonus #28 Science: Chemistry – 4 parts

Given a plastic's recycling number and code, name the polymer to which they refer.

1. number two, HDPE
2. number three, PVC
3. number five, PP
4. number six, PS

Answers: 1. [*Prompt an incomplete answer.*]  
**high density polyethylene** [*pol-lee-ETH-uh-leen*]  
2. **polyvinyl chloride** [*pol-lee-VINE-ul*]  
3. **polypropylene** [*pol-lee-PROH-puh-leen*]  
4. **polystyrene** [*pol-lee-STY-reen*]

Toss Up #29 Language Arts: U.S. Literature

The main character of this work throws a Chinese-themed housewarming party to welcome her new neighbors, but it does not turn out as well as she hopes. To recover from the perceived humiliation, she and Will return to St. Paul for a short visit and to have real Chinese food. Gopher Prairie does not work out, so Carol leaves Will and moves to Washington, D.C., but eventually returns to small town Minnesota. Name this 1920 Pulitzer Prize winning Sinclair Lewis novel.

Answer: **Main Street**

Bonus #29 Mathematics: Calculus – 3 parts

*[NOTE: "at and around the point" is awkward, but correct wording.]*

Give the term associated with each of these descriptions of the behavior of  $F$  of  $X$ , at and around the point,  $X$  equals  $C$ .

1. the first derivative at  $C$  equals zero, and the second derivative at,  $C$  is less than zero
2. the first derivative at  $C$  equals zero, and the derivative when,  $X$  is less than  $X$ , has the same sign as when,  $X$  is greater than  $C$
3. the first derivative, at  $C$  equals zero

Answers:   1.    **local maximum**  
              2.    **saddle point**  
              3.    **critical point**



Toss Up #30 Mathematics: Calculus – 30 seconds

Find the second derivative of F of X, where F of X equals the tangent of X.

Answer: *[Do not prompt an incomplete answer.]*  
**two secant squared X tangent X**

Notation: $f(x) = \tan x \rightarrow f''(x) = 2\sec^2 x \tan x$
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Bonus #30 Science: Physics – 4 parts

Identify these terms from rotational mechanics.

1. This quantity, conserved in the absence of an external net torque, is one of the three defining characteristics of a black hole. I need a two-word term.
2. The law of conservation of the quantity you named in part one is responsible for this law stating that a line drawn between an orbiting body and a focus of its orbit will sweep out equal areas in equal times.
3. Torque is at a maximum when the angle between the lever arm and the force producing the torque is this measure in degrees.
4. In the SI nomenclature system, torque is measured in this two-word unit, which is dimensionally but not conceptually equivalent to joules.

- Answers:
1. *[Accept either. Do not prompt an incomplete answer.]*  
**angular momentum**  
**rotational momentum**
  2. *[Prompt an incomplete answer.]*  
**Kepler's Second Law of Planetary Motion**
  3. **ninety degrees**
  4. *[Accept either.]*  
**newton-meter**  
**meter-newton**