

Aegis Questions

**District 207 Championship 2008
Frosh/Soph Round 1**

Tossup 1: Science (Astronomy)

While Galileo saw this body, he believed it to be a star, because it is 30 times farther from the sun than the Earth is. Discovered in 1846, the only spacecraft to visit it, Voyager 2, did so in 1989. It has 13 moons, the largest of which is Triton. Its Great Dark Spot is not well-understood, but methane in its atmosphere is thought to contribute to this planet's distinctive blue color. Name this farthest planet from the sun, which is named after the Roman god of the sea.

Answer: **Neptune**

Bonus 1: Social Studies (U.S. History)

Identify these facts related to the assassination of Abraham Lincoln.

A: Lincoln was shot on April 14th, 1865, by this actor.

B: Lincoln was viewing this play at the time.

C: At the same time as Lincoln's assassination, Lewis Powell attempted to kill this Secretary of State, but failed.

D: When Lincoln's assassin was finally found at Garrett Farm on April 26th, this companion of his was found with him.

Answers: A: **John Wilkes Booth** B: **Our American Cousin** C: **William Henry Seward, Sr.** D: **David Edgar Herold**

Tossup 2: Literature (Literature)

The name is the same. It is the name of Eli's grandson from the book of I Samuel. He was born on the day that Eli died and the day that the Ark of the Covenant was captured in battle. John Greenleaf Whittier wrote a poem titled this. The name is also the first name of a character from a Washington Irving short story. Give this name that can be found in the short story "The Legend of Sleepy Hollow," where it is the first name of a schoolteacher whose surname is Crane.

Answer: **Ichabod**

Bonus 2: Math (Other)

Find the number of ways the following can occur.

A: You arrange eight people in any order.

B: You choose three leaders out of a group of 10.

C: You choose a president, a secretary, and a treasurer out of a group of 10.

D: You rearrange the letters in the word FACTORIAL.

Answers: A: **40320** B: **120** C: **720** D: **181,440**

Tossup 3: Social Studies (World History)

Because he had no male children, he took an especial interest in the fate of his daughter Julia, marrying her off three times to Marcellus, his adviser Agrippa, and his eventual heir Tiberius. He also married his sister Octavia to fellow triumvir Marc Anthony, but when Anthony left Octavia for Cleopatra, this man seized the excuse to declare war on his former ally, whom he eventually defeated at the Battle of Actium. Name this grandnephew of Julius Caesar, the first Roman emperor.

Answer: **Augustus Caesar**

Bonus 3: Fine Arts (Visual Art)

Identify the work of art from a description.

A: The middle panel of a triptych, this Bosch work portrays many scenes from biblical creation.

B: This Magritte work consists of a pipe, and the words "Ceci n'est pas une pipe."

C: This painting shows two boats on the water, and is the basis for the name of the Impressionist movement.

D: An early surrealist painting, Chagall painted a green faced man stating intimately at a sheep or a goat in this painting.

Answers: A: **The Garden of Earthly Delights** B: **The Treachery of Images** (*accept La trahison des images*) C: **Impression, Sunrise** D: **I and the Village**

Tossup 4: Math (Geometry) -- Computational (30 Seconds)

Include units and simplify. Given triangle ABC, what is the length of side AC if angle ABC is 120 degrees, side AB is 5 centimeters, and side BC is 3 centimeters?

Answer: **7 centimeters**

Bonus 4: Social Studies (Geography)

So you think you're smart, eh? then answer these questions regarding the provinces of Canada.

A: Charles Degaulle stirred secessionist sentiment in this province when he visited in 1967.

B: If this province truly resembled the English translation of its name, you'd expect to find it full of kilted men playing bagpipes and eating haggis.

C: This province will soon follow in Alberta's footsteps and host the Winter Olympiad.

D: Canada's previous winter olympic games took place in Calgary, a city in this province.

Answers: A: **Quebec** B: **Nova Scotia** C: **British Columbia** D: **Alberta**

Tossup 5: Fine Arts (Music)

A popular myth says that his name was called as a secret nationalist slogan to bring Vittorio Emmanuel II to power. The myth states that this happened around the time of his opera Nabucco, and whether it is true or not, his popularity did skyrocket soon afterwards with operas such as Macbeth. Identify this Italian composer famous for two other Shakespearean adaptations, Otello and Falstaff, as well as Aida (*aye-EE-da*) and Rigoletto.

Answer: **Giuseppe Verdi**

Bonus 5: Miscellaneous (Sports)

Curses and dry spells in the sports world are nothing new. Given information about the long-suffering city or sports franchise, name the city or franchise.

A: Once a perennial contender for NFL championships, this NFC team has won only one playoff game in the past forty years.

B: This entire city supposedly remains in the grip of the curse of William Penn due to a title drought for all four major sports teams which has lasted from 1984 to the present.

C: An attempt to break a curse bewitching this team during game six of the 2003 NLCS backfired disastrously.

D: While the American version of "Fever Pitch" follows the Boston Red Sox, the original British version relates to this London football club, who plays home matches in Emirates Stadium.

Answers: A: **Detroit Lions** B: **Philadelphia Pennsylvania** (*prompt on Philly*) C: **Chicago Cubs** (*prompt on Cubbies*) D: **Arsenal**

Tossup 6: Social Studies (Other)

His one and only visit to the United States in 1909 caused quite a stir. Mystery still surrounds some of the events which occurred that autumn involving him and his colleague, Carl Jung. More famous, however, is his theory regarding the Interpretation of Dreams. Name this Austrian pioneer of psychoanalysis, famous for saying, "sometimes a cigar is just a cigar."

Answer: **Sigmund Freud**

Bonus 6: Math (Geometry)

Find the areas of the following triangles.

A: The equilateral triangle with side length 8.

B: The isosceles triangle with leg length 4 and base length 3.

C: The triangle with vertices at (3, 3), (4, 5), and (2, 8).

D: The triangle with sides of length 12, 37, and 35.

Answers: A: **16 root 3** B: **6** C: **7/2** D: **210**

Tossup 7: Miscellaneous (Entertainment)

Chris Noth and Cynthia Nixon starred in the first season of this highly acclaimed television show. First appearing on NBC in 1990, it has produced a number of successful spinoff series. It remains on the air to this day, despite having none of the original cast members still with the show. Name this long-running crime drama.

Answer: **Law and Order**

Bonus 7: Literature (Literature)

Given three works by an author, name the author.

A: Typee, Billy Budd, Moby-Dick

B: Roughing It, The Celebrated Jumping Frog of Calaveras County, A Connecticut Yankee in King Arthur's Court

C: The Cancer Ward, The Gulag Archipelago, One Day in the Life of Ivan Denisovich

D: The Real Inspector Hound, Arcadia, Rosencrantz & Guildenstern are Dead

Answers: A: **Herman Melville** B: **Mark Twain** (accept *Samuel Langhorne Clemens*) C: **Alexander Solzhenitsyn** D: **Tom Stoppard**

Tossup 8: Math (Algebra) -- Computational (30 Seconds)

What are the x and y coordinates of the x intercepts of the equation y equals x squared minus 5 x minus 1?

Answer: **(3,0) and (1,0)** (in either order)

Bonus 8: Science (Biology)

Identify these animals that are masters of camouflage.

A: These long-tongued lizards are naturally camouflaged and usually only change between shades of green and brown when frightened.

B: This small relative of the octopus and squid can produce almost any color and can even change the polarization of light reflected off its skin.

C: The slow-moving insects of the order Phasmatodea are so well concealed in the trees where they live that they are commonly called walking these.

D: This North American rabbit species is known for its big feet and ability to change from a brown coat in summer to a white one in winter.

Answers: A: Chameleons B: Cuttlefish C: Walking Sticks D: Snowshoe Hare

Tossup 9: Literature (Mythology)

This creature originally appears in ancient Egyptian mythology and may have been inspired by the flamingo of East Africa. It has a lifespan of either 500 or 1461 years and is a symbol of divinity and resurrection. Name this bird which spontaneously combusts only to rise anew from the ashes.

Answer: Phoenix

Bonus 9: Math (Other)

Given an unfair coin, where the probability of getting heads is $\frac{3}{4}$, find the following probabilities. Give your answer as a fraction.

A: Probability of getting tails.

B: Probability of getting three heads in a row.

C: Probability of getting one heads and one tails in two flips.

D: Probability of getting more than one tails in two flips.

Answers: A: $\frac{1}{4}$ B: $\frac{27}{64}$ C: $\frac{3}{8}$ D: $\frac{1}{16}$

Tossup 10: Science (Physics)

After being devised by Nicolas Carnot and James Joule, this was expressed mathematically in 1856, as “the integral of change in heat over temperature equals the equivalence-value,” which was later defined as entropy. It states that all reversible engines have the same efficiency, and that heat flows spontaneously from a hotter to a colder substance. Name this law, which most famously states the total entropy in the universe always increases when an irreversible process occurs.

Answer: Second Law of Thermodynamics

Bonus 10: Literature (Literature)

Given a brief description, name the nineteenth or twentieth century British satirist.

A: His work *Hard Times* is a criticism of working conditions in nineteenth-century London. His novels, including *Great Expectations*, are often satirical of Victorian England.

B: This author is best-known for *Animal Farm* and 1984.

C: His stories poke fun at the British upper class; his most famous character, the valet Jeeves, must often save his master Bertie Wooster from entanglements.

D: Stories by this author, such as "The Toys of Peace" and "The Open Window" were often satirical of early-twentieth-century British society.

Answers: A: **Charles Dickens** B: **George Orwell** (accept *Eric Arthur Blair*) C: **P(elham) G(renville) Wodehouse** D: **Saki** (accept *H(ector) H(ugh) Munro*)

HALFTIME

Tossup 11: Literature (Literature)

He gained fame as a reporter, and he covered the Greco-Turkish War and the Spanish-American War. He often covered life in the slums, which likely influenced one of his most famous novels, whose protagonist commits suicide by jumping into a river. That novel was his first commercial success, and was titled *Maggie: A Girl of the Streets*. Name this author who wrote about Civil War soldier Henry Fleming in *The Red Badge of Courage*.

Answer: **Stephen Crane**

Bonus 11: Miscellaneous (Interdisciplinary)

Answer these questions about music, sports, and history.

A: This man was the lead singer of the British rock band Queen.

B: This woman from California won Wimbledon for the fourth time in 2007.

C: This is the title of the first movement of Gustav Holst's "The Planets".

D: This is the name for the British plan to invade Norway, which was called off in 1942.

Answers: A: **Freddie Mercury** B: **Venus Williams** (*prompt on Williams*) C: **Mars, the bringer of war**

D: **Operation Jupiter**

Tossup 12: Math (Algebra) -- Computational (30 Seconds)

Simplify the logarithm base 5 of 36, times the logarithm base 6 of 25.

Answer: **4**

Bonus 12: Science (Biology)

Identify the following, relating to the eye.

A: In the science world, nearsightedness is commonly called this.

B: A diverging lens can help correct myopia. The most common unit to measure refractive power of these lenses is this, measured in inverse meters.

C: This affliction occurs when the cornea is not circular and therefore cannot properly focus light.

D: The eye is protected by this hard, opaque layer of collagen, which turns into the cornea in front of the lens.

Answers: A: **Myopia** B: **Diopter** C: **Astigmatism** D: **Sclera**

Tossup 13: Miscellaneous (Sports)

As a fighter pilot in the Korean War, he flew 38 combat missions, including several with future senator John Glenn. His work overseas earned him an Air Medal, but he earned far more fame for his work on terra firma, as a member of the Boston Red Sox. Name this outfielder who was the last major leaguer in history to have a season batting average of over .400.

Answer: **Ted Williams**

Bonus 13: Fine Arts (Music)

Answer the following about the composition of symphony orchestras.

A: Four horns, two trumpets, three trombones, and a tuba are the minimum requirement for this section of the orchestra.

B: Most of the instruments in this section of the orchestra contain reeds, though flutes and piccolos are exceptions.

C: Glockenspiels, vibraphones, and gongs are some of the more exotic instruments which can be found in this section. More common are timpani and triangles.

D: The largest section of an orchestra, the strings, contains violins, violas, cellos, and basses, but is also home to these instruments.

Answers: A: **Brass** B: **Woodwinds** C: **Percussion** D: **Harp**

Tossup 14: Science (Chemistry)

He proposed a helical model for DNA, which was incorrect, but unlike Watson and Crick, he did not get a chance to see Rosalind Franklin's crucial data. He made many other contributions, however, such as his spheron model of the nucleus and, most significantly, his work on the chemical bond, which won him the 1954 Nobel Prize in Chemistry. Name this inventor of the concept of electronegativity, the only person to win two unshared Nobel Prizes.

Answer: **Linus Pauling**

Bonus 14: Social Studies (Geography)

Identify these Twin Cities.

A: The most famous twin cities are these two large cities in Minnesota.

B: These cities located along I-55 are home to Illinois State University.

C: The flagship campus of the Illinois school system is located in these twin cities.

D: This capital of Slovakia is connected to Vienna by the Twin City Liner.

Answers: A: **Minneapolis-St.Paul** B: **Bloomington-Normal** C: **Urbana-Champaign** D: **Bratislava**

Tossup 15: Fine Arts (Visual Art)

Painted in the year 1889, only a year before the artist's death, it is considered by many a masterpiece of Post Impressionism. It depicts cypress trees next to a small town, church steeple and all, with clouds and a full moon intermixed in the night sky above. Name this painting by Vincent Van Gogh.

Answer: **Starry Night**

Bonus 15: Science (Physics)

Find the equivalent resistance of the following sets of resistors, in ohms.

A: Two 27-ohm resistors aligned in series.

B: A 4-ohm resistor in parallel with a 6-ohm resistor.

C: A 10-ohm resistor in parallel with a 5-ohm resistor.

D: Three 9-ohm resistors, all connected in parallel to a series of five 3-ohm resistors.

Answers: A: **54 ohms** B: **2.4 ohms** (accept 12/5 ohms) C: **10/3 ohms** D: **2.5 ohms** (accept 5/2 ohms)

Tossup 16: Social Studies (U.S. History)

A brilliant warrior who fought against the U.S. Government in the American West, he is to this day remembered favorably by Native Americans throughout the West. While stories of his remains being an integral part of Yale Skull and Bones initiation ceremonies are probably apocryphal, the tales of his warfare against American and Mexican military commanders in the West, spanning four decades, are not. Name this Apache warrior and medicine man.

Answer: **Geronimo**

Bonus 16: Math (Algebra)

Find the following means.

A: The geometric mean of 3 and 8.

B: The geometric mean of 6, 2, and 18.

C: The harmonic mean of 3 and 8.

D: The arithmetic mean of 10 numbers if one number is 6, and the arithmetic mean of the other nine numbers is 4.

Answers: A: **2 root 6** B: **6** C: **48/11** D: **4.2** (accept 21/5)

Tossup 17: Science (Biology)

It is either single-unit or multi-unit, and its cells have only one nucleus. It is typically controlled by the autonomous nervous system, and lines blood vessels in the tunica media layer. Lacking distinct sarcomeres, it is the only type of muscle that is not striated. Name this muscle tissue that lines the gastrointestinal tract and is involuntarily controlled.

Answer: **Smooth muscle**

Bonus 17: Literature (Literature)

Given a description, identify the novel by John Steinbeck.

A: George kills his companion Lennie at the end of this novel.

B: In this work, the Joad family heads west during the Great Depression.

C: Adam, Aaron, Cal, and Charles are names of characters in this work set in Salinas Valley.

D: This work, set in a namesake area of Monterey, centers around Doc, Lee Chong, and Mack.

Answers: A: **Of Mice and Men** B: **The Grapes of Wrath** C: **East of Eden** D: **Cannery Row**

Tossup 18: Math (Other) -- Computational (30 Seconds)

You have three red books, two green books, and two mauve books. If books of a single color are indistinguishable, how many different ways can you line them up on your bookshelf?

Answer: **210**

Bonus 18: Social Studies (World History)

Given a description, identify these wars associated with a length of time.

A: This war between France and England occurred in three phases and concerned the right of the King of England to also be the King of France.

B: This global war included several other smaller wars, including the French and Indian War and the Pomeranian War.

C: This war fought mostly on German soil started out as a religious war between Protestants and Catholics but was also motivated by the rivalry between France and the Habsburg dynasty.

D: This war was prompted by the Egyptian expulsion of United Nations peacekeeping forces from the Sinai Peninsula and started with a pre-emptive attack by Israel for fear of being invaded by Egypt.

Answers: A: **Hundred Years' War** B: **Seven Years' War** C: **Thirty Years' War** D: **Six-Day War**

Tossup 19: Literature (Literature)

He readily admitted his brother Mycroft was the smarter of the two siblings. However, due to Mycroft's poor work ethic, his dumber, more driven brother went on to fame and fortune as one of London's greatest detectives. He survived numerous close shaves, including a battle with Dr. Moriarty in Baker Street. Name this fictional detective.

Answer: **Sherlock Holmes**

Bonus 19: Science (Chemistry)

Identify the following gas laws.

A: Pressure times volume over temperature is constant for any particular sample of gas.

B: Pressure times volume equals moles times R times temperature.

C: Pressure and volume are inversely proportional.

D: Volume and temperature are directly proportional.

Answers: A: **Combined gas law** B: **Ideal gas law** C: **Boyle('s) law** D: **Charles('s) law**

Tossup 20: Social Studies (Geography)

The original duke who took his name from this English provincial town was murdered in 1628. The event would later become a focal point of Alexandre Dumas' novel "The Three Musketeers."

However, the town is better known for being the namesake of a building, one of the British Royal family's official residences. Name this town in the South-East of England.

Answer: **Buckingham**

Bonus 20: Literature (Literature)

Identify the following about poems written in Victorian England.

A: Dedicated to Prince Albert, this is the collective name of the twelve narrative poems by Alfred, Lord Tennyson recounting Arthurian legend.

B: The poem that opens "How do I love thee? Let me count the ways." was originally published in this famous collection of poetry.

C: The title of this 1875 poem by William Ernest Henley means "unconquered", and ends with "I am the master of my fate: I of my soul."

D: This poem by Robert Browning starts with a nobleman showing a prospective wife's emissary a painting of the title character.

Answers: A: **Idylls of the King** B: **Sonnets from the Portuguese** C: **Invictus** D: **My Last Duchess**

TIEBREAKERS/REPLACEMENTS:**Tossup: Literature (Literature)**

The protagonist works as a traveling salesman, and at one point his angry boss comes to check on him. The protagonist's malady, which appeared suddenly, keeps him from doing little more than lying in bed. He is looked after by his sister, Grete, but most of his family, and later Grete herself, shun him. Name this work by Franz Kafka about Gregor Samsa, who turns into a giant bug.

Answer: **The Metamorphosis** (accept *Die Verwandlung*)

Bonus: Science (Chemistry)

Answer these questions about four elements you'd be hard-pressed to find on Earth.

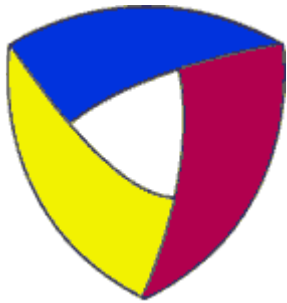
A: The existence of this transition metal, with symbol Tc, was predicted by Mendeleev but it wasn't until 1937 that it was artificially created in a cyclotron.

B: This highly radioactive metal, found below cesium on the Periodic Table, has the lowest electronegativity, though too few atoms have been found to measure its other properties.

C: Because its half-life is never more than nine hours, less than one ounce of this halogen, number 85, exists on Earth at any given time, making it the rarest naturally occurring element.

D: Having no stable isotopes, this rare lanthanide with the symbol Pm has few modern applications aside from its occasional use in glow-in-the-dark paints.

Answers: A: **Technetium** B: **Francium** C: **Astatine** D: **Promethium**



Aegis Questions

**District 207 Championship 2008
Frosh/Soph Round 2**

Tossup 1: Social Studies (U.S. History)

While some oil men make a hobby out of foolish purchases, this oil baron was an exception to the rule. He maintained a lifelong habit of thrift until his dying day, often walking the halls of his large mansion turning off lights which had been left burning, just so he could save a few dollars a year. He did, however, spend millions of dollars to establish the University of Chicago in association with the Baptist Church. Name this American industrialist and first dollar billionaire.

Answer: **John Davison Rockefeller**

Bonus 1: Literature (Literature)

Given a description, name these British Satirists.

A: His first major satire was A Tale of a Tub, but this author is probably better known for A Modest Proposal and Gulliver's Travels.

B: This author of The Perennial Philosophy is more famous for creating Bernard Marx and John the Savage in his Brave New World.

C: This master of witty banter and dialog created plays such as Lady Windermere's Fan and The Importance of Being Earnest.

D: This first English Poet Laureate wrote Mac Flecknoe as a satire of fellow poet Thomas Shadwell and Absalom and Achitophel to criticize Charles II.

Answers: A: **Jonathan Swift** B: **Aldous Leonard Huxley** C: **Oscar Wilde** D: **John Dryden**

Tossup 2: Math (Geometry) -- Computational (30 Seconds)

Find the length of side B in triangle ABC if side A measures 6 degrees, side C measures 12 units, and angle B equals 60 degrees. This situation corresponds to the law of cosines.

Answer: **6√3 units**

Bonus 2: Science (Physics)

Given an definition using SI base units, name the official SI unit used in physics.

A: One kilogram-meter per second squared.

B: One kilogram-meter squared per second cubed.

C: One kilogram per meter-second squared

D: One meter squared per second squared

Answers: A: **Newton** B: **Watt** C: **Pascal** D: **Gray**

Tossup 3: Literature (Literature)

In this play, Adriana refuses to allow her husband into their house because she thinks he is seeing other women. However, she had been misinformed, as her servant, Dromio of Ephesus, reports that her husband didn't even know who she was. This is because the man, Antipholus of Syracuse, isn't actually her husband, and just looks like him. Name this play by William Shakespeare about the hilarity that ensues when two sets of twins are unknowingly in close proximity.

Answer: **The Comedy of Errors**

Bonus 3: Social Studies (Geography)

What's in a name? A number of the world's cities have changed their names for one reason or another over the centuries. Given a description of the city with an identity crisis, give the current name.

A: Sitting astride the Bosphorous between Europe and Asia Minor, this city received its current name after conquest in 1453.

B: Peter Stuyvesant's inability to rally his citizens against the invading English led to the conquest and renaming of this Dutch colony in the New World.

C: This city once bore the name of the Soviet Union's head of state, but it now bears the name of the Russian river on which it is located.

D: Once a German city, then a free city, and now a Polish city, this town on the Baltic held the nucleus of the Solidarity movement.

Answers: A: **Istanbul** B: **New York** C: **Volgograd** D: **Gdansk**

Tossup 4: Science (Biology)

About 80% fat and 20% protein, this layer was discovered by Ranvier in 1878. Loss of it is characteristic of Guillain-Barre syndrome, multiple sclerosis, and many other neurodegenerative diseases. Secreted by Schwann cells, gaps in it are called nodes of Ranvier. Name this sheath which insulates axons and greatly increases the efficiency of the nervous system.

Answer: **Myelin**

Bonus 4: Literature (Literature)

Ulysses, or Odysseus, has been a popular figure in Western literature since the writing of The Odyssey. Answer these questions about the famous warrior.

A: Ulysses was king of this island.

B: In 1833 this British poet wrote a dramatic monologue from the point of view of Ulysses, which he published in 1842.

C: Ulysses' long absence from home was due to the long siege of this city in Asia Minor.

D: James Joyce's stream of consciousness novel of the same name chronicles the Dublin journeys of this man.

Answers: A: **Ithaca** B: **Alfred, Lord Tennyson** C: **Troy** D: **Leopold Bloom**

Tossup 5: Social Studies (World History)

Born in Blenheim palace, this British politician served as First Lord of the Admiralty in the leadup to the First World War, and became Chancellor of the Exchequer for the Conservative Party in the late 1920s before resigning over the party's policy on India. He then spent most of the thirties in the political wilderness, before becoming 1st Lord again, and then Prime Minister in May of 1940. Name this cigar-smoking wartime British Prime Minister.

Answer: **Winston Churchill**

Bonus 5: Math (Geometry)

Find the areas of the following shapes.

A: A trapezoid with bases of length 15 and 17 and a height of 22.

B: A triangle with sides length 7, 8, and 9.

C: An equilateral triangle with sides of length 28.

D: A rhombus with diagonals of 26 and 34.

Answers: A: **352** B: **12 root 5** C: **196 root 3** D: **442**

Tossup 6: Fine Arts (Visual Art)

In 1930, this man painted a work for a museum in San Francisco. Three years later, he was not allowed to finish his painting of Man At the Crossroads at Rockefeller Center, because in it he had depicted a communist leader, and this artist himself was communist. Name this Mexican muralist who was married to Frida Kahlo.

Answer: **Diego Rivera**

Bonus 6: Science (Astronomy)

Identify these astronomical objects.

A: This is a spherical group of comets surrounding the solar system thought to be the origin of long-period comets.

B: This region of the solar system containing Pluto is thought to have many other small objects, not unlike the asteroid belt.

C: These very bright objects with very high redshift are now thought to be large amounts of matter surrounding the black holes at the center of galaxies.

D: This new term introduced in 2006 refers to a spherical body which is not large enough to clear its surroundings of planetary debris, and thus, like Pluto, is not a planet.

Answers: A: **(Opik-)Oort cloud** B: **Kuiper belt** C: **Quasar** D: **Dwarf planet**

Tossup 7: Science (Chemistry)

It was discovered in 1669 by German scientist Hennig Brand while he was examining human urine. After evaporating the urine, he noticed a residual white, glow-in-the-dark, and extremely flammable substance. Compounds of this are used in fireworks, matches, and explosives. This element also plays a key role in biology as it is found in DNA and RNA, and is found in all cellular membranes. Name this group five element, whose atomic number is 15 and whose symbol is P.

Answer: **Phosphorus**

Bonus 7: Social Studies (U.S. History)

The United States has absorbed a number of independent nations which later became states. Given the last year of its nationhood, name the future state which became part of the United States.

A: 1791

B: 1846

C: 1845

D: 1898

Answers: A: **Vermont** B: **California** C: **Texas** D: **Hawaii**

Tossup 8: Miscellaneous (Entertainment)

In over a dozen of his films, this British-born actor started fights via a game of pattycake. Somewhat more dignified were his roles in "The Paleface" and "The Big Broadcast of 1938". However, he is best known for his work with the USO, traveling the world during conflicts from the Second World War to Desert Storm, entertaining troops. Name this famous actor, entertainer, and honorary veteran.

Answer: **Robert "Bob" Hope**

Bonus 8: Fine Arts (Music)

Identify the following Italians from a description.

A: Rumored to have sold his soul to the devil, this famous violinist, composed 24 Caprices for the violin.

B: He composed an opera about a boy and his mother who receive the Magi on their way to Bethlehem, Ahmal and the Night Visitors.

C: He composed The Barber of Seville, La Cenerentola and William Tell.

D: He composed the operas Tosca, Turandot and La Boheme.

Answers: A: **Niccolò Paganini** B: **Gian-Carlo Menotti** C: **Gioachino Rossini** D: **Giacomo Puccini**

Tossup 9: Math (Algebra) -- Computational (30 Seconds)

Find the inverse of the matrix with top row 1, 3, and bottom row 3, 6.

Answer: **Top row: -2, 1, bottom row: 1, -1/3**

Bonus 9: Science (Biology)

Given a branch of zoology, name the type of animal studied.

A: Apiology.

B: Entomology.

C: Ichthyology.

D: Malacology.

Answers: A: **Bees** B: **Insects** C: **Fish** D: **Mollusks**

Tossup 10: Literature (Literature)

The basis for the title character may well have been Gregorio Fuentes, though he himself tells another story. A boy, Manolin, visits the title character of this work everyday, bringing him food and talk of American Baseball, in particular, Joe DiMaggio. Taking place in Cuba and recounting the story of a fisherman, Santiago, who has gone 84 days without a catch before finally hooking a massive Marlin, identify this work written by Ernest Hemingway.

Answer: **The Old Man and the Sea**

Bonus 10: Miscellaneous (Sports)

Given information surrounding the move of a Major League Baseball team from one city to another, give the current name of the team in question.

A: This team was the first major league franchise on the West Coast. Owner Walter O'Malley's decision to move the team to California resulted in his exclusion from the Baseball Hall of Fame for nearly fifty years.

B: Washington D.C. had a baseball team for nearly sixty years, until it left for greener pastures out west in 1961.

C: Washington D.C. then received a second baseball team. It lasted only a decade before also heading west in 1971.

D: This team bid au revoir to Montreal after the 2004 season, leaving Canada with only one major league baseball franchise.

Answers: A: **Los Angeles Dodgers** B: **Minnesota Twins** C: **Texas Rangers** D: **Washington Nationals**

HALFTIME

Tossup 11: Science (Earth Science)

Developed at Caltech by its namesake and Beno Gutenberg, a one-unit increase on this scale represents an increase in energy output by about 32-fold. The scale is defined, however, as a base-10 logarithmic scale where a one-micrometer displacement on a seismometer graph is equivalent to zero. Identify this scale whose highest recorded value was 9.5, a scale for measuring the magnitude of earthquakes.

Answer: **Richter scale**

Bonus 11: Math (Algebra)

Evaluate the following expressions involving logarithms.

A: The natural log of e cubed.

B: The log base 2 of 1024.

C: The log base 4 of 3, times the log base 3 of 4.

D: The log base 8 of 1/64.

Answers: A: **3** B: **10** C: **1** D: **-2**

Tossup 12: Literature (Literature)

This man fought for the Union Army in the Civil War, an experience later recollected in the work What I Saw of Shiloh. He worked for William Randolph Hearst on the San Francisco Examiner, but he is more famous for his stories. He partook in the Mexican Revolution, which led to his eventual disappearance. Name this author of The Devil's Dictionary and An Occurrence at Owl Creek Bridge.

Answer: **Ambrose Gwinett Bierce**

Bonus 12: Fine Arts (Visual Art)

Identify the following buildings:

A: While William Thornton was the original designer, he was succeeded by Benjamin Latrobe and later Charles Bullfinch. The dome and two wings were designed by Thomas Walter and August Schoenborn.

B: James Hoban built this structure in the Georgian style, though Benjamin Latrobe was called in just a few years later to expand it.

C: This building designed by George Bergstrom has over over 15 miles of pathways.

D: Located at 935 Pennsylvania Avenue, you cannot tour the inside. Built in the Brutalist style with poured concrete, it is named for a long time leader of the agency which turns 100 in 2008.

Answers: A: **United States Capitol Building** B: **White House** C: **Pentagon** D: **J. Edgar Hoover Building** (*prompt on FBI Building*)

Tossup 13: Math (Other) -- Computational (30 Seconds)

Your answer should be a fraction and can be either positive or negative. 3 clear, 3 black, and 3 white marbles are placed in a bag. Find the difference between the probabilities that two black marbles are pulled from the bag with replacement and that two black marbles are pulled from the bag without replacement.

Answer: **1/36** (*accept -1/36*)

Bonus 13: Science (Chemistry)

Name the following acids, given their formulas.

A: H N O₃.

B: C H₃ C O O H.

C: H₃ B O₃.

D: C₆ H₅ O H.

Answers: A: **Nitric acid** B: **Acetic acid** (*accept ethanoic acid*) C: **Boric acid** D: **Phenol**

Tossup 14: Miscellaneous (Sports)

He and his family were scheduled to take an excursion on the S.S. Eastland the day it capsized in the Chicago River, taking 844 people to their deaths. Fortunately, he never boarded the vessel, and went on to a storied career in professional football. His impact on the game was so great that the NFC Championship trophy is named after him. Identify this former coach of the Chicago Bears, whose initials, still to this day, adorn the sleeves of Bears players.

Answer: **George S. Halas**

Bonus 14: Literature (Mythology)

Given a brief description, name the mortal hero from Greek mythology.

A: This hero slew the gorgon Medusa with the help of Athena and Hermes, then rescued Andromeda from a monster of the Red Sea.

B: This hero killed the Minotaur in the Labyrinth and found his way out of that maze with the help of Ariadne.

C: This hero built the Argo, then quested after the Golden Fleece with his Argonauts, eventually gaining it with the help of Medea.

D: This hero tamed the winged horse Pegasus with Athena's help, then with its aid slew the Chimera.

Answers: A: **Perseus** B: **Theseus** C: **Jason** D: **Bellerophon**

Tossup 15: Social Studies (World History)

Although he refrained from sacking Constantinople, this is more likely a result of its strong walls and rich bribes than of any appreciation for culture. Likewise, he did not attack Rome, but this restraint was probably due to fear of divine punishment should he invade the latter, a fear which was probably enhanced by his meeting with Pope Leo I. However, his thirst for conquest was otherwise strong, for he extended his territory from small holdings in the central Asian steppes all the way to Germany in the West and the Baltic Sea in the South. Name this barbarian king who ravaged all of Eastern Europe, thus gaining the nickname "The Scourge of God."

Answer: **Attila the Hun**

Bonus 15: Math (Algebra)

Identify the following related to expanding polynomials.

A: How many terms are in the expansion of the quantity x plus y , quantity cubed?

B: What is the sum of the coefficients in the expansion of the quantity x plus $2y$, quantity to the fourth power?

C: What is the coefficient of the xy squared term in the expansion of the quantity x plus $2y$, quantity cubed?

D: What is the sum of the coefficients in the expansion of the quantity $2x$ plus $3y$, quantity to the fifth power?

Answers: A: 4 B: 81 C: 12 D: 3125

Tossup 16: Fine Arts (Music)

The second act of this opera begins with Florestan singing of his faith in God and having a vision of his love coming to visit him. The beginning of it involves Marzelline's denial of Jaquino's marriage proposal due to her love for the title character, who is actually a woman in disguise. Ending with Florestan being freed by Leonore, identify this only opera composed by Ludwig van Beethoven.

Answer: Fidelio

Bonus 16: Social Studies (U.S. History)

Given information about a vessel of the United States Navy, please respond with the state or city for which it is named.

A: This heavy cruiser delivered fissionable material for the Hiroshima bomb to Tinian before sinking in shark-infested waters.

B: This vessel went to the bottom of Havana harbor in 1898; its sinking helped start the Spanish-American War.

C: It's understandable that President Truman would have a soft spot for this battleship, so much so that he and his family once rode it back to the states from Rio de Janeiro.

D: After a lifetime of service, this battleship has become a floating museum, and is now moored in the Delaware River overlooking Philadelphia.

Answers: A: U.S.S. Indianapolis B: U.S.S. Maine C: U.S.S. Missouri D: U.S.S. New Jersey

Tossup 17: Math (Geometry) -- Computational (30 Seconds)

Find the distance between the polar point $(4\sqrt{2}, 3\pi/4 \text{ radians})$ and the Cartesian point $(4, 2)$. You will likely need to convert one point to the other coordinate system.

Answer: $\sqrt{68}$

Bonus 17: Miscellaneous (Interdisciplinary)

Answer the following regarding Angels & Demons.

A: This author of Digital Fortress and Deception Point also wrote the recent novel "Angels and Demons"

B: According to Islam, this angel appeared to Mohammed and ordered him to recite, which resulted in the creation of the Koran.

C: Name the young priest who successfully exorcises Regan's demon in "The Exorcist".

D: This Illinois University's sports teams compete under the name "Blue Demons".

Answers: A: Dan Brown B: Gabriel C: Damien Karras D: DePaul University

Tossup 18: Social Studies (Geography)

What's in a name? In September 2007, this country's National Assembly attempted to pass a bill limiting children's names to a list of 100 acceptable ones after names such as Eisenhower, Hitler, Batman, and Superman surfaced. Name this South American nation, a member of OPEC whose currency is being renamed to the Strong Bolivar as of 2008 by order of president Hugo Chavez.

Answer: **Bolivarian Republic of Venezuela**

Bonus 18: Literature (Literature)

Identify these plays by William Shakespeare.

A: Iago is the enemy of this title character.

B: Prospero and Miranda live on an island in this work.

C: Polonius gives Laertes the advice "Neither a borrower nor a lender be" in this play.

D: Lucius and Martius are sons of the title character, a Roman general, in this play.

Answers: A: **Othello** B: **The Tempest** C: **Hamlet** D: **Titus Andronicus**

Tossup 19: Science (Physics)

This effect demonstrates the quantization of light energy, but does not occur below the threshold frequency. If light has sufficient frequency, or energy, it will knock electrons off of metal atoms, inducing a current in the metal. It was first explained by Albert Einstein in 1905, winning him the Nobel Prize. Name this effect by which shining light on metal induces a current.

Answer: **Photoelectric effect**

Bonus 19: Math (Other)

Find the probability of the following occurring, given a standard 52-card deck.

A: You draw two black cards in a row.

B: You draw a black card, followed by a spade.

C: You draw a jack, queen, or king.

D: You draw a jack, followed by a queen, followed by a jack, queen, or king.

Answers: A: **25/102** B: **25/204** C: **3/13** D: **4/3315**

Tossup 20: Literature (Literature)

His treatise condemning censorship, Areopagitica, was one of the works consulted during the drafting of the US Constitution. The sequel to his most famous work was published alongside of his tragic closet drama, Samson Agonistes. Eventually becoming blind, identify this poet, most famous for introducing the word pandemonium and using Lucifer as a protagonist in his epic poem Paradise Lost.

Answer: **John Milton**

Bonus 20: Social Studies (World History)

Identify these places where it's good to be the king, but only if you're dead.

A: Tutankhamen, Ramses II, and Hatshepsut are among the pharaohs entombed in this country's Valley of the Kings.

B: One of the original Seven Wonders of the World, this tomb in the city of Halicarnassus was built for a tyrant by his widow.

C: More than 6,000 life-size terra-cotta soldiers guard the tomb of Shi Huang-ti, (*she WONG-dee*) the first sovereign emperor of this country.

D: The Mughal Emperor Shah Jahan had this magnificent white marble tomb built for his favorite wife and was later interred there himself.

Answers: A: **Egypt** B: **Mausoleum** C: **China** D: **Taj Mahal**

TIEBREAKERS/REPLACEMENTS:**Tossup: Fine Arts (Music)**

It was dedicated to the composer's pupil and possible love interest Giulietta Guicciardi, and the "like a fantasy" in its title was added due to its unconventional layout. The second of its three parts, the Allegretto, is short and serves to blend the Adagio Sostenuto and the final storm-like Presto Agitato. Earning its nickname from a description by Ludwig Rellstab of light shining on Lake Lucerne, identify this piano sonata by Ludwig van Beethoven.

Answer: **Moonlight Sonata** (*accept Piano Sonata Number 14 in C-sharp Minor*)

Bonus: Literature (Literature)

Name each of the following characters from Homer's "Iliad."

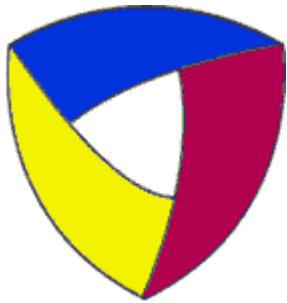
A: The war begins when this man captures Helen of Troy.

B: Of all the gods in the work, this is the only one who does not become involved in the fighting.

C: This King of Troy did not fight, but many of his fifty sons were commanders in the war.

D: This brother of King Menelaus (men-uh-LAY-us) is the King of Mycenae.

Answers: A: **Paris** B: **Zeus** C: **Priam** D: **Agamemnon**



Aegis Questions

**District 207 Championship 2008
Frosh/Soph Round 3**

Tossup 1: Science (Chemistry)

Used during the time of the Roman Empire to tint glass yellow, this element was formally discovered by the German chemist Klaproth in 1789. In 1896, Antoine Becquerel discovered that, if left out, it could expose a photograph; this led to his discovery of radioactivity. Enrico Fermi discovered in 1934 that if it was struck with neutrons, beta particles were produced. Primarily extruded from the mineral pitchblende, some isotopes of this element have half lives exceeding one billion years. Identify this heaviest of the naturally occurring elements, number 92 on the periodic table.

Answer: Uranium

Bonus 1: Social Studies (Other)

Hopefully none of you will have to visit any of these fine institutions. Answer the following about famous American prisons.

A: Al Capone spent the years 1933 to 1939 in this California prison.

B: Herman Mudgett, the serial killer whose reign of terror corresponded with the 1893 Chicago World's Columbian Exposition, was executed at Moyamensing prison in this U.S. state.

C: A riot at this New York prison in 1971 led to twenty-eight deaths and prison reforms.

D: The only death chamber run by the federal government is located at this facility.

Answers: A: Alcatraz B: Pennsylvania C: Attica D: Terre Haute Federal Correctional Complex

Tossup 2: Literature (Literature)

Many of this author's works were set in his childhood home of Danzig, including the trilogy which features his most famous novel. Other works by him include Cat and Mouse and, most recently, Crabwalk. In 2006, it was discovered that this author had served in the Waffen SS during World War II. Name this author who wrote about Oskar Matzerath in The Tin Drum.

Answer: Gunter Wilhelm Grass

Bonus 2: Math (Geometry)

Given the measure of an internal angle of a regular polygon, give the number of sides that the polygon has.

A: 60 degrees

B: 170 degrees

C: 120 degrees

D: 174 degrees

Answers: A: 3 B: 36 C: 6 D: 60

Tossup 3: Social Studies (Geography)

In 1811, this river flowed South to North for a period of time, an unusual occurrence as it usually flows North to South. This happened because an earthquake epicentered near New Madrid, Missouri, estimated to be at least 8.0 on the Richter scale, hit with such power that it reversed the flow of the river for over a month. Name this river, which flows past St. Louis, Memphis, and New Orleans, the longest in the United States.

Answer: Mississippi

Bonus 3: Fine Arts (Visual Art)

Identify the following artists identified with the Impressionist movement.

A: His 1872 painting, Impression, Sunrise, lent its name to the movement.

B: Born in modern Pittsburgh, this artist painted many mother and daughter subjects, and was a part of four Impressionist exhibitions.

C: Born in the Virgin Islands, this "Father of Impressionism" focused on painting rural life and landscapes around Pontoise and Montmartre.

D: Undoubtedly his most famous work is the 1881 piece "Luncheon of the Boating Party".

Answers: A: **Claude Monet** (*MO-nay; not Manet*) B: **Mary Stevenson Cassatt** C: **Camille Pissarro**

D: **Pierre-Auguste Renoir** (*ren-WAH*)

Tossup 4: Math (Other) -- Computational (30 Seconds)

You have two fair six-sided dice, and you roll both of them twice. What is the probability that you get a total of seven on the first roll, and four on the second roll?

Answer: 1/72

Bonus 4: Social Studies (U.S. History)

Identify the following facts related to George Washington.

A: Washington lived at this house on the Potomac.

B: This man served as Washington's only Vice President.

C: This man, who succeeded Washington as Commander-in-Chief of the Continental Army, was the nation's first Secretary of War.

D: The portrait this artist painted of Washington is the image found on the One-Dollar Bill.

Answers: A: **Mount Vernon** B: **John Adams** (*prompt on Adams*) C: **Henry Knox** D: **Gilbert Charles Stuart**

Tossup 5: Fine Arts (Music)

His most famous set of works takes its title from Act III of Shakespeare's Othello, in a line of conversation between the title Othello and Iago. Other works by him include The Dream of Gerontius, The Apostles as well as a work that includes a part titled Nimrod, as tribute to August Jaeger. That work, the Enigma Variations, also included a portion dedicated to his wife Alice. Identify this composer who also composed the Pomp and Circumstance Marches, the first of which is commonly heard at graduation ceremonies.

Answer: **Edward Elgar**

Bonus 5: Miscellaneous (Sports)

Answer these questions about baseball, America's pastime.

A: This pitcher gave up Barry Bonds' 756th home run.

B: This the first year in which any World Series games were played west of the Rocky Mountains.

C: This current team used to be known as the St. Louis Browns.

D: This baseball organization is sometimes called the senior circuit.

Answers: A: **Mike Bacsik** B: **1959** C: **Baltimore Orioles** D: **National League**

Tossup 6: Social Studies (World History)

Written in the 18th century BC, this document was discovered in the Persian Mountains in 1901. While it begins and ends with a prayer to the gods, it is not a religious document, but rather a legal one. Entry 22 states anyone found committing a robbery will be put to death, while 196 famously explains "if a man put out the eye of another man, his eye shall be put out." Identify this set of Babylonian laws, named after an ancient king.

Answer: **Hammurabi's Code** (accept *Codex Hammurabi*)

Bonus 6: Math (General)

Answer the following questions that all involve, at some point, factorials.

A: What is the value of 6 double factorial?

B: How many ways can the letters in the word BANANA be arranged?

C: What is the value of $8C5$?

D: What is 10 factorial divided by 7 factorial?

Answers: A: **48** (6 times 4 times 2) B: **60** C: **56** D: **720**

Tossup 7: Miscellaneous (Entertainment)

Comedian Joe Florentine said that this song "Set white people back 50 years." Released in 1991, according to VH1 it is the 5th most awesomely bad song ever, but that didn't stop rap mogul Suge Knight from claiming that the lyrics were written by someone else. The line "I'm cooking MC's like a pound of bacon" might be a reference to MC Hammer, whose track "U Can't Touch This" beat out this song for Best Rap Solo Performance at the Grammys. Despite its popularity, it's likely that Queen didn't enjoy the song, as the artist was criticized for stealing the bassline from their "Under Pressure." Name this song, to which you might want to "collaborate and listen," by Vanilla Ice.

Answer: **Ice, Ice Baby**

Bonus 7: Literature (Literature)

Identify the following American works written after World War II.

A: Undoubtedly Vladimir Nabokov's most famous and controversial work, it follows Humbert Humbert's obsession with Dolores Haze.

B: Neal Cassady, a friend of the author, is the model for the protagonist Dean Moriarty in this classic travelogue published in 1957.

C: Estehr Greenwood is the subject of this semi-autobiography whose author, Sylvia Plath, committed suicide about a month after its 1963 publication.

D: This science fiction novel follows Billy Pilgrim's time shifts through his life. The title refers to the German POW camp where he spent part of World War Two.

Answers: A: **Lolita** B: **On the Road** C: **The Bell Jar** D: **Slaughterhouse Five**

Tossup 8: Math (Algebra) -- Computational (30 Seconds)

Find the discriminant of a quadratic equation with zeros at $x=4$ and $x=-2$, where the coefficient of the x squared term is one.

Answer: **36**

Bonus 8: Science (Physics)

Given the approximate value of a physical constant, identify the constant by name. Use its name, not just the letter that represents it.

A: Three times 10 to the eighth, meters per second.

B: 6.02 times 10 to the 23rd power, inverse moles.

C: 6.67 times 10 to the negative 11, meters cubed over kilogram seconds squared.

D: 6.63 times 10 to the negative 34, Joule seconds.

Answers: A: **Speed of light in a vacuum** B: **Avogadro('s) number** C: **Universal gravitation(al) constant** (*accept similar*) D: **Planck('s) constant**

Tossup 9: Literature (Literature)

Marion Mainwaring completed this author's unfinished last novel, *The Buccaneers*, in 1993, 56 years after this author's death. One of her works is set in Starkfield, in which Mattie and the title character take a disastrous sled ride. She created the character Lily Bart, who appears in *The House of Mirth*. Name this author of *Ethan Frome* and *The Age of Innocence*.

Answer: **Edith Wharton**

Bonus 9: Math (Other)

Find the probability of the following events occurring.

A: You flip three heads in a row.

B: You flip four of the same coin flip in a row.

C: You hit the bullseye of radius 1 inch, on a dartboard with radius 6 inches.

D: You roll a sum of six on two six-sided dice.

Answers: A: **1/8** B: **1/8** C: **1/36** D: **5/36**

Tossup 10: Science (Chemistry)

This substance, the first allotrope to be discovered, was discovered at the University of München in 1840. Its name is derived from the Greek word for scent, because of the distinctive odor created by its release in lightning strikes. Preceding chlorine as a water disinfectant, it is still used in many locations around the world for this purpose. Identify this molecule, considered a pollutant at low altitudes but beneficial in the stratosphere because of its ability to block ultraviolet light.

Answer: **Ozone** (*Prompt Triooxygen*)

Bonus 10: Literature (Language Arts)

English verbs have five characteristics. Given a short description, provide the characteristic.

A: There are three of these, each of which is associated with a specific set of personal pronouns such as he and it.

B: This shows the relationship between the subject and verb, specifically whether the subject is doing or receiving the action of the verb.

C: This property denotes the time at which the action of the verb occurs. Two examples of it are present progressive and past perfect.

D: There are three of these, two of which are indicative and imperative. They are used to indicate the sense or intent of a verb.

Answers: A: **Person** B: **Voice** C: **Tense** D: **Mood**

HALFTIME

Tossup 11: Literature (Literature)

She wishes to be a gentlewoman, and sleeps with more than fifteen men during the course of the novel. She flees from her 3rd husband after only a few years of marriage, when she discovers that her mother-in-law is also her mother. Her 5th husband, a banker, dies in ruin, and she becomes an accomplished thief. When caught, she is taken to her birthplace, Newgate Prison, to be judged, and she lives out the rest of her days as a felon in Virginia. Give the name of this woman who was for twelve years a whore, five times a wife, once to her own brother, twelve years a thief, and eight years a transported felon in Virginia, the titular character in a work by Daniel Defoe.

Answer: **Moll Flanders**

Bonus 11: Miscellaneous (Interdisciplinary)

Answer the following things about some stuff.

A: Born in Frankfurt-am-Main in Germany, he starred in both Bad Boys movies and Big Momma's House.

B: Born in 1885, this Englishman authored works such as Sons and Lovers and Lady Chatterley's Lover.

C: Peter O'Toole earned an Oscar nomination for his portrayal of this British Army officer who fought the Turks in the first world war.

D: In the course of a soliloquy near the beginning of Romeo & Juliet, he reminds us all that "virtue turns itself vice, being misapplied."

Answers: A: **Martin Lawrence** B: **David Herbert Lawrence** C: **Thomas Edward Lawrence** (*accept Lawrence of Arabia*) D: **Friar Lawrence**

Tossup 12: Math (Algebra) -- Computational (30 Seconds)

Cathy and Jim want to know how long it would take both of them to paint a fence together.

Independently, Cathy can paint the fence in 5 hours, while Jim can do it in 20 hours. It may help to know that the combined time can be found by taking the reciprocal of the sum of the reciprocals of Cathy and Jeff's individual working times.

Answer: **4 hours**

Bonus 12: Science (Earth Science)

Given a brief description, answer the following about categories of rocks.

A: These sorts of rocks are formed by the solidification of magma or lava. They include granite and pumice.

B: These rocks are formed by the gradual buildup of small particles which when compressed become rocks characterized by a banded or layered appearance, such as limestone and shale.

C: Rocks in this category, which includes gneiss and marble, develop from other rocks because of temperature or pressure extremes.

D: Rocks do not remain in any of the three main categories forever; instead, they move through each in this process which includes steps such as crystallization, weathering, and deposition.

Answers: A: **Igneous** B: **Sedimentary** C: **Metamorphic** D: **The Rock Cycle**

Tossup 13: Miscellaneous (Other)

The Treskilling Yellow is the world's most valuable at \$2.5 million, followed by the British Guiana Magenta even though both are defective. The rare Mauritius Blue is prized for being the first imperial one issued outside the U.K. and the first to include the word "Office." The most desirable American one is certainly the Inverted Jenny, which has the 1918 biplane printed upside-down. For the average philatelist, however, the most popular commemorative one remains the 1993 Elvis Presley. Identify this small adhesive rectangle now costing 41 cents from the U.S. Postal Service.

Answer: **Postage stamp**

Bonus 13: Fine Arts (Music)

Given a description, identify the musical form.

A: This type of piece often written by Bach is either sung by choruses or soloists.

B: Typically found in operas, this type of song that does not advance the plot is sung usually by a single character, and accompanied by instruments.

C: This short piece is performed when trying to measure one's proficiency at a certain skill, and comes from the French for "study."

D: This instrumental piece is the introduction to an opera.

Answers: A: **Cantata** B: **Aria** C: **Etude** D: **Overture**

Tossup 14: Science (Physics)

Formalized in 1960, its seventh base unit, the mole, was added in 1971. Its original predecessor was the CGS system, which was later replaced by the MKS system, which uses meters, kilograms, and seconds as its base units. This system, unlike those, can account for all physical phenomena with combinations of its base units, which also include amperes, kelvins, and candelas. Name this modern version of the metric system, whose abbreviation comes from its French name.

Answer: **SI** (accept *International System of Units* or *Système international*, prompt *metric system*)

Bonus 14: Social Studies (U.S. History)

If you had a middle name like these, you'd probably use the initial in its place, just like these former Presidents once did. Given the middle name of a U.S. President, please give his other two names.

A: Delano

B: Fitzgerald

C: Baines

D: Gamaliel (*Ga-MAY-lee-el*)

Answers: A: **Franklin Roosevelt** B: **John Kennedy** C: **Lyndon Johnson** D: **Warren Harding**

Tossup 15: Fine Arts (Visual Art)

Many figures, including one who appears to be Jesus, are at the top of this painting. A man shrouded in gray stands to the left of the title character, who is being held by two religious figures robed in yellow. A small woman stands at the foreground of the painting, pointing at the title character's body. Name this painting depicting a man being lowered into the ground by El Greco.

Answer: **The Burial of the Count of Orgaz** (accept *El Entierro del Conde de Orgaz*)

Bonus 15: Science (Biology)

Identify these cellular organelles.

A: The so-called "power plant" of the cell, this organelle is responsible for generating ATP, which is used for energy.

B: These membrane-less organelles are responsible for translating mRNA into proteins.

C: Found primarily in plants and algae, these organelles are responsible for photosynthesis.

D: These organelles are small membrane-bound sacs which contain enzymes capable of breaking down other organelles, food, or foreign objects.

Answers: A: **Mitochondria** B: **Ribosome** C: **Chloroplast** D: **Lysosome**

Tossup 16: Social Studies (Geography)

Antonio Armijo and others in his party named this settlement, back when it was still part of Mexico. It is the largest city in Clark County, and in 1855, a party of Mormon missionaries arrived to convert the local Paiute Indians. However, things took a turn in 1931 when gambling was legalized. Name this city, the largest in Nevada.

Answer: **Las Vegas**

Bonus 16: Math (Algebra)

Given the definition of a term from set theory, identify the term.

A: This is the number of elements in a set.

B: This is the set consisting of all subsets of a set.

C: This is the set of all elements found in both of two sets.

D: This is the set of all elements found in either or both of two sets.

Answers: A: **Cardinality** B: **Power set** C: **Intersection** D: **Union**

Tossup 17: Science (Biology)

One of this fluid's functions is to keep surrounding tissue above a pH of 5.5 by neutralizing organic acids. It also contains several antibacterial agents and the mucin component acts as a good lubricant for the bolus. Secreted by the parotid, sublingual, and submandibular glands, name this liquid that primarily serves as the transfer medium for the enzyme amylase.

Answer: **Saliva**

Bonus 17: Literature (Literature)

Identify the following British playwrights whose names do not rhyme with "akespeare".

A: "Volpone" and "The Alchemist" are among the comedies of this early seventeenth century playwright and contemporary of Shakespeare.

B: Among his works are the controversial "Doctor Faustus", "The Jew of Malta", and "Dido, Queen of Carthage."

C: His two most famous works were "Equus" and "Amadeus" about the Salieri-Mozart rivalry.

D: Though born in Czechoslovakia, he is best known for works like "15 Minute Hamlet" and "Rosencrantz and Guildenstern are Dead".

Answers: A: **Benjamin Jonson** B: **Christopher Marlowe** C: **Peter Levin Shaffer** D: **Tom Stoppard**

Tossup 18: Math (Geometry) -- Computational (30 Seconds)

Units are not necessary. Find the volume of a right circular cylindrical silo topped with a right circular cone if the radius of the cylinder is twelve feet, the height of the cylinder alone is twenty feet, and the slant height of the cone is thirteen feet.

Answer: **3120 pi cubic units**

Bonus 18: Social Studies (World History)

Given information about a dictator's demise, name the despot in question.

A: After being liberated by SS units under Otto Skorzeny (*Score-ZAY-knee*), this dictator gained a new lease on life, which lasted until he was executed by firing squad in a garage forecourt.

B: Christmas Day, 1989, was not a Merry Christmas for this Romanian dictator, who was tried and executed on that day.

C: Born in Austria, this man became emperor of Mexico at the behest of the French ruler, only to be captured and executed by Republican forces in 1867.

D: This dictator was retired forcibly twice, once to Elba in the Mediterranean, and again to the island of St. Helena in the South Atlantic.

Answers: A: **Benito Mussolini** B: **Nicolae Ceausescu** (*chou-SHESS-kou*) C: **Maximilien I** D: **Napoleon Bonaparte**

Tossup 19: Literature (Language Arts)

To an astronomer, this word specifically refers to the reappearance of a celestial body after an eclipse. P. T. Barnum often collected double admission at his museum by hanging a sign that used the word after the phrase "This way to the the...", which tricked patrons into walking out the exit door. This word also describes the type of windows that must be installed in basement apartments in case of fire as well as a filtering method that prevents unauthorized traffic from leaving an internal computer network. Identify this word, a synonym of emerge and escape, that means the opposite of ingress.

Answer: **Egress**

Bonus 19: Science (Chemistry)

Identify the following terms related to chemistry.

A: This is the temperature and pressure at which a substance can be present as a liquid, solid, and gas simultaneously.

B: This is the amount of energy required for two molecules to proceed forward with a reaction.

C: This is the number of moles of a component of a mixture divided by the total amount of moles in the mixture.

D: This term refers to properties of substances that are correlated only with the number of dissolved particles, and not their identity.

Answers: A: **Triple point** B: **Activation energy** C: **Mole fraction** D: **Colligative properties**

Tossup 20: Social Studies (U.S. History)

In the 1930s, he was one of two men President Roosevelt named as “the most dangerous men in the country;” he was the one that did not die in an assassination. Instead, he survived duty in the Philippines from 1941-42, evacuation from Corregidor via PT-Boat 41, a term as military governor of Japan, and commanded U.N. forces in the Korean War before fading away and dying peacefully in 1964. Name this five star general.

Answer: **Douglas MacArthur**

Bonus 20: Literature (Literature)

Identify the American poet of the early twentieth century.

A: His "The Red Wheelbarrow" was published in 1923 in the collection "Spring and All".

B: This poet is best remembered for his unconventional use of punctuation and capitalization.

"anyone lived in a pretty how town" is an example of his work.

C: There were 109 of his Cantos by 1959, though the first 16 had been published by 1925. The most controversial are perhaps the Pisan Cantos.

D: His 1925 poem, "The Hollow Men" literally ends "Not with a bang but a whimper".

Answers: A: **William Carlos Williams** B: **Edward Estlin Cummings** C: **Ezra Weston Loomis Pound** D: **Thomas Stearns Eliot**

TIEBREAKERS/REPLACEMENTS:**Tossup: Literature (Literature)**

He began his life studying to be a surgeon and apothecary under Thomas Hammond, but soon left his studies for poetry. In 1818, he fell madly in love with his neighbor, Fanny Brawne. In the months following his marriage, he created his great works such as “The Eve of St. Agnes,” “La Belle Dame sans Merci,” and all of his great odes. Name this man whose odes include “Ode to a Nightingale,” “Ode on Melancholy,” and “Ode on a Grecian Urn.”

Answer: **John Keats**

Bonus: Social Studies (Geography)

Answer the following questions involving extreme elevations.

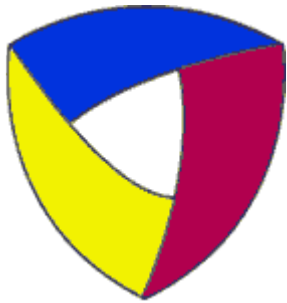
A: This body of water is the lowest point on earth not covered by ice, and is famous for its high salinity.

B: This Caucasian peak is the highest point in Europe.

C: This Hawaiian volcano is the highest point in the state, and is the tallest mountain in the world when measured from its undersea base to its summit.

D: This mountain is found on the border between Pakistan and China and is the second highest point in the world.

Answers: A: **Dead Sea** B: **Mount Elbrus** C: **Mauna Kea** D: **K2** (accept *Mount Godwin-Austen*)



Aegis Questions

**District 207 Championship 2008
Varsity Round 1**

Tossup 1: Science (Physics)

When free, this baryon decays in about 15 minutes, and it is composed of an up quark and two down quarks. Depending on their speed in reactors, they can be called cold, thermal, or hot. When bound, they sometimes undergo beta decay, turning into a neutrino, electron, and proton. Deuterium has an extra one of these, having a mass of two atomic mass units but only one proton. Name this nucleon without any electric charge, the counterpart to protons.

Answer: **Neutron**

Bonus 1: Social Studies (U.S. History)

Identify the U.S. presidents who issued these proclamations.

A: "...all persons held as slaves within any State or designated part of a State the people whereof shall then be in rebellion against the United States shall be then, thenceforward, and forever free;"

B: "Finally, it should be the earnest and paramount aim of the military administration to win the confidence, respect, and affection of the inhabitants of the Philippines by assuring them in every possible way that full measure of individual rights and liberties which is the heritage of a free people..."

C: "Whereas it appears that a state of war exists between Austria, Prussia, Sardinia, Great Britain, and the United Netherlands of the one part and France on the other, and the duty and interest of the United States require that they should with sincerity and good faith adopt and pursue a conduct friendly and impartial toward the belligerent powers..."

D: "I..., pursuant to the pardon power conferred upon me by Article II, Section 2, of the Constitution, have granted and by these presents do grant a full, free, and absolute pardon unto Richard Nixon for all offenses against the United States..."

Answers: A: **Abraham Lincoln** B: **William McKinley** C: **George Washington** D: **Gerald R. Ford**

Tossup 2: Literature (Literature)

Despite this dramatist's pacifist-sounding last name, he proved to be quite courageous, disavowing the appeasement policies his Prime Minister, Neville Chamberlain, directed against Hitler. He even went so far as to undertake covert operations on continental Europe to gather intelligence for the war he saw coming. Who was this playwright and lyricist, famous for works such as "Mad Dogs and Englishmen" and "The Vortex"?

Answer: **Noel Coward**

Bonus 2: Math (Geometry)

Find the volumes of the following solids.

A: A cube with surface area 96.

B: A sphere with a great circle of circumference 6 pi.

C: A square pyramid with base of side length 2, and height of 3.

D: A sphere with surface area 16 pi.

Answers: A: **64** B: **36 pi** C: **4** D: **32 pi / 3**

Tossup 3: Social Studies (Geography)

Once called Agiocochook, the first known ascent of this mountain was by Darby Field in the year 1642. In 1934, it was the site of the world's highest recorded wind speed, 231 miles per hour. It is situated in the Presidential Range of the White Mountains, although its namesake was only a general when it was given its current name. Identify this New Hampshire mountain, the highest point in New England.

Answer: **Mt. Washington**

Bonus 3: Fine Arts (Music)

Given a description, identify the work by Puccini.

A: In this Opera, Cio-Cio San commits suicide after learning that her American husband has taken a new bride.

B: Emperor Altoum is the father of the title character in this opera, which was unfinished when Puccini died.

C: This opera contains the characters Mimi and Rodolfo.

D: Cavaradossi and Angelotti are two of the characters in this play, which originally premiered in 1900.

Answers: A: **Madama Butterfly** (accept *Madame Butterfly*) B: **Turandot** C: **La Bohème** D: **Tosca**

Tossup 4: Math (Algebra) -- Computational (30 Seconds)

Convert 3 2 7 base 8 into base 4.

Answer: **3 1 1 3** base 4

Bonus 4: Social Studies (World History)

Given a brief description, name these empires, the four largest by area to date.

A: Charles III held sway over the more than 7,300,000 square miles of this fourth largest empire, the great majority of which lay in North and South America.

B: Over 8,800,000 square miles made up this third most expansive empire, though soon after the death of its last ruler in 1917, Finland and its Polish holdings broke away.

C: Although in second place, this empire deserves special mention as the largest contiguous empire, with over 12,800,000 square miles, mostly in Asia. It is also the oldest of the top four, having achieved its greatest extent in the mid thirteenth century.

D: In first place with over 14,100,000 square miles of area comes this empire, over which the sun truly never set for much of the late 1800s and early 1900s.

Answers: A: **Spanish Empire** B: **Russian Empire** C: **Mongol Empire** D: **British Empire**

Tossup 5: Fine Arts (Visual Art)

This painting has transfixed many visitors to the Art Institute of Chicago. Painted over the course of three years, from 1884 to 1886, this painting exemplifies the trend toward a more scientific, analytical approach to art which was gathering strength in the French art community throughout the latter half of the 19th Century. Observing this painting usually draws one's eyes to either a reclining man or a woman with an umbrella and a monkey at her feet. Identify this pointillist masterpiece by Georges Seurat.

Answer: **A Sunday Afternoon on the Island of La Grande Jatte** (accept *Un dimanche après-midi à l'Île de la Grande Jatte*)

Bonus 5: Miscellaneous (Entertainment)

So, you think you're a Simpsons fan, eh? Let's see how well you know these facts from TV's longest running cartoon.

A: Principal Seymour Skinner's real name.

B: The last name of Moe, the local bartender.

C: Comic Book Guy's real name.

D: The two policemen of the town who are quoted as saying "we don't have last names, we're like Cher."

Answers: A: **Armin Tamzarian** B: **Szyslak** C: **Jeff Albertson** D: **Eddie and Lou** (accept either order)

Tossup 6: Social Studies (U.S. History)

While Tracy Jordan's planned biopic about this president fell through for lack of funding, I'm sure the deceased president in question doesn't mind. With a monument dedicated to him standing in Washington D.C., some honors just aren't as important. He also invented a number of gadgets, notably the dumbwaiter. Who was this Virginian President of the United States?

Answer: **Thomas Jefferson**

Bonus 6: Math (Calculus)

Find the slopes of the following curves at x equals 1.

A: f of x equals the log base 8 of x .

B: f of x equals $3e$ to the x squared minus 1 power.

C: f of x equals 4 times the sine of $2\pi x$.

D: f of x equals $5x$ cubed plus $2x$ squared minus $9x$ plus 1.

Answers: A: **1 over the natural log of 8 or the log base 8 of e** B: **6** C: **8 pi** D: **10**

Tossup 7: Miscellaneous (Interdisciplinary)

Educated in Padua, he is mentioned by Dante many times, wrote about the importance of silence in music, and discounted the music of the spheres. In 1223 he became a Dominican, and preached around Bavaria. Name this philosopher who defended the scholasticism of his famous student Thomas Aquinas, and may have first isolated arsenic.

Answer: **Saint Albertus Magnus** (accept *Saint Albert the Great*, *Albert of Cologne*, or *Albert Magnus*)

Bonus 7: Literature (Literature)

Identify these facts related to author J.D. Salinger.

A: Salinger is best known for this work about Holden Caulfield.

B: This short story tells of Seymour and Muriel; Seymour ends up committing suicide after telling someone about the titular character.

C: In this work, one of the title characters carries around a copy of *Way of the Pilgrim*; the other title character, her older brother, speaks offensively to his mother.

D: This is the name of the family in both parts B and C.

Answers: A: **The Catcher in the Rye** B: **A Perfect Day for Bananafish** C: **Franny and Zooey** D: **Glass**

Tossup 8: Math (Geometry) -- Computational (30 Seconds)

A right cylindrical silo of height 50 feet and diameter 20 feet is having the roof and external wall painted at a cost of \$3 per one pi square foot of paint. What is the total cost of the paint?

Answer: **3,300 dollars**

Bonus 8: Science (Physics)

Calculus is an integral part of physics. Identify the following, which are all found by combining the two.

A: Finding the area under the curve of a pressure vs. volume graph yields this quantity, which can be expressed in ergs.

B: The slope of the line tangent to a graph of jerk vs time can be used to find this, measured in meters per seconds raised to the fourth power.

C: Integrating a force, in terms of time, yields this, which can be measured in Newton-seconds.

D: Take a derivative of the amount of charge passing a specific point with respect to time to find this quantity, measured in amperes.

Answers: A: **Work** (accept Energy) B: **Jounce** (accept Snap) C: **Impulse** D: **Electric Current**

Tossup 9: Literature (Literature)

Only published by the author's mother after the author's suicide, this novel begins with the protagonist waiting outside a department store for his mother, whom he still lives with, even though he is 30 years old. The title character works at Levy Pants with odd characters such as Miss Trixie, and one of his only friends is Myrna Minkoff. Name this work about Ignatius J. Reilly by John Kennedy Toole.

Answer: **A Confederacy of Dunces**

Bonus 9: Math (General)

Identify the following mathematicians.

A: This Swiss mathematician invented graph theory and his identity that e to the i pi equals negative one.

B: This French mathematician who died at age twenty invented a namesake theory linking fields and groups, which proved that some quintic equations cannot be solved with radicals.

C: This French topologist proposed his namesake conjecture, which was recently proven by Grigory Perelman.

D: This English woman and daughter of Lord Byron studied Charles Babbage's analytical engine.

Answers: A: **Leonhard Euler** B: **Evariste Galois** C: **Henri Poincaré** D: **Ada Lovelace**

Tossup 10: Science (Chemistry)

A common non-polar solvent, it was named by Berzelius after the resin from which it was first isolated. It is toxic like its aromatic parent compound. It can be found in some aerosols and also functions as an octane booster in gasoline. It forms xylene when a methyl is added, and benzene when demethylated. Perhaps better known, however, is that adding three nitro groups turns it into the explosive TNT. Name this compound also known as methyl-benzene.

Answer: **Toluene**

Bonus 10: Literature (Literature)

Answer these questions relating to the Charge of the Light Brigade.

A: The event took place during the reign of this British monarch.

B: According to the poem, how many cavalry boldly rode, and well.

C: Give the name of the British commanding officer, who shared his last name with a type of sweater.

D: Name the conflict during which this event took place.

Answers: A: **Queen Victoria** B: **Six hundred** C: **Lord Cardigan** D: **Crimean War**

HALFTIME

Tossup 11: Literature (Literature)

The oldest living Nobel Laureate in Literature, a number of his works were suppressed by the government, leading to them initially circulating in samzidat, or underground publication. He was eventually deported from the Soviet Union in 1974, and in the same year finally received the Nobel Prize that he had won in 1970. Experiencing things first hand that led him to write *The Cancer Ward* and *The Gulag Archipelago*, identify this man, whose experience as a prisoner also contributed to his *One Day in the Life of Ivan Denisovich*.

Answer: **Aleksandr Solzhenitsyn**

Bonus 11: Miscellaneous (Interdisciplinary)

Answer the following questions about the play "A Doll's House"

A: Name the playwright who wrote "A Doll's House."

B: Identify the nationality of the playwright.

C: This painter of "The Scream" held the same nationality as the playwright in question.

D: Macaroons feature heavily in the first act of "A Doll's House". Which item of produce, native to the tropics, is a chief ingredient in macaroons?

Answers: A: **Henrik Ibsen** B: **Norwegian** (*Do not accept Norse*) C: **Edvard Munch** D: **Coconut**

Tossup 12: Math (Calculus) -- Computational (30 Seconds)

Find dy/dx at the point (2, 3) for the equation x to the fourth times y , plus y cubed, equals 75.

Answer: **-96/43**

Bonus 12: Science (Biology)

Answer these questions related to biology. All the answers begin with the letter M.

A: This type of substance causes DNA to mutate.

B: This famous experiment conducted in 1953 attempted to show that biomolecules could spontaneously form on a primordial earth.

C: In this type of mimicry, the mimic resembles a more successful species, and unlike in Batesian mimicry, actually shares the other's characteristic.

D: This type of B cell is longer-lived than plasma cells, and allows the immune system to later recognize antigens it has already been exposed to.

Answers: A: **Mutagen** B: **Miller-Urey experiment** (*prompt Miller*) C: **Müllerian mimicry** D: **Memory B cell**

Tossup 13: Miscellaneous (Sports)

He was instrumental in merging the BBA and NBL, two separate American basketball leagues existing prior to the NBA. With his help, the two leagues became one. Because of his instrumental role in the merger, he was named the first president of the NBA. At the time of his appointment to president, he was also the president of the American Hockey League. During his tenure, he introduced the NBA to the 24-second shot clock and widened fan interest by landing the league's first television deal. Name this man, a Jewish immigrant, whose name is honored on the trophy for the NBA's Most Valuable Player.

Answer: **Maurice Podoloff**

Bonus 13: Fine Arts (Visual Art)

Identify these artists not necessarily known for painting or standard sculpture.

A: This Bulgarian creates what he calls environmental installation art. This includes wrapping up the Reichstag in 1995, or putting up 37 kilometers of yellow gates in New York in 2005.

B: His father and grandfather of the same name were also sculptors, but he branched out into moving art, creating mobiles such as 1939's Lobster Trap and Fish Tail.

C: His photograph "The Tetons and the Snake River", taken in 1942, was included as one of the images carried on the Voyager missions.

D: This Russian created a series of sixty-nine unique works of jewelry, seven of which were gifted to the Kelch family, and the rest to the Russian Tsars. "Hen", created in 1885 was the first.

Answers: A: **Christo** B: **Alexander Calder** C: **Ansel Easton Adams** D: **Peter Carl Faberge**

Tossup 14: Science (Biology)

Occurring during the pachytene stage, this is accomplished with Holliday junctions, which allow the independent assortment of genes with substantial genetic distance. This essential meiotic process that occurs in prophase I causes two paired strands of DNA to swap alleles, resulting in genetic recombination. Name this process described by Thomas Morgan and physically discovered by Barbara McClintock.

Answer: **Crossing over** (*accept crossover*)

Bonus 14: Social Studies (U.S. History)

Identify these facts related to an 1894 strike.

A: The strike occurred at this Illinois company that made railway sleeping cars.

B: This president sent in troops to break up the strike.

C: The strike was organized by this leader of the American Railway Union.

D: The answer to part C was defended in court by this lawyer, more famous for his representation of John Scopes in the Monkey Trial.

Answers: A: **Pullman** B: **Grover Cleveland** C: **Eugene Victor Debs** D: **Clarence Seward Darrow**

Tossup 15: Fine Arts (Music)

He produced a trilogy of operas based on portraits of men, the second of which was Satyagraha, based on Ghandi, and the third of which was Akhnaten, an opera written primarily in Akkadian, Hebrew and Ancient Egyptian. The man behind the scores for The Truman Show, Notes on a Scandal, and The Hours, identify this minimalist composer whose third opera in the portrait trilogy was about the dangers of nuclear war and was titled Einstein on the Beach.

Answer: **Philip Glass**

Bonus 15: Science (Chemistry)

Identify the following chemists, given their important contributions.

A: This French chemist developed the law of conservation of mass.

B: His book The Skeptical Chemist developed many modern chemical principles and proposed that all reactions are due to collisions of particles.

C: This Swedish chemist produced an early definition of acids and bases as an extension of his ionic theory.

D: This American chemist developed namesake dot structures and modern bond theory.

Answers: A: **Antoine Lavoisier** B: **Robert Boyle** C: **Svante Arrhenius** D: **Gilbert Lewis**

Tossup 16: Social Studies (Other)

Some people called him cruel for keeping his infant daughter in a glass box that he called an Air-crib. Often at odds with critic Noam Chomsky, he wrote *Beyond Freedom and Dignity*, a work which suggests that a technology of behavior could help make a better society. Identify this man, famous for his eponymous "box" that facilitates experiments involving operant conditioning and for his utopian book, *Walden Two*.

Answer: **Burrhus Frederic Skinner**

Bonus 16: Math (Algebra)

Convert the following numbers to base 10.

A: 3 4, base 100.

B: 1 0 0 1, base 2.

C: 1 0 0 1, base 5.

D: 5 6, base 16.

Answers: A: **304** B: **9** C: **126** D: **86**

Tossup 17: Science (Astronomy)

Lasting ten years and costing more than 19 billion dollars, this program produced an artistic photograph, "The Blue Marble." President Kennedy compared it to a football game between Rice University and the University of Texas. Its direct results include cordless power tools and dehydrated food, although it is commonly incorrectly associated with the powdered drink Tang. Identify this series of missions, developed with the goal of landing a man on the moon before 1970.

Answer: **Project Apollo** (accept *Apollo Program*)

Bonus 17: Literature (Literature)

Identify these masterpieces of satire.

A: In this famous work by Voltaire, the title character is repeatedly assaulted, robbed, and separated from his love, but still believes that he lives in the "best of all possible worlds."

B: This Joseph Heller novel mocks absurd bureaucracy with its title rule making anyone crazy enough to fly dangerous missions sane enough for the job.

C: Many readers of the time thought this Jonathan Swift essay was serious in suggesting that the poor people of Ireland ease their suffering by eating their children.

D: All the worst traits of Tsarist Russia are laid out in this Gogol play about a young clerk who is mistaken for a government agent by corrupt town officials.

Answers: A: **Candide, ou l'Optimisme** B: **Catch-22** C: **A Modest Proposal** D: **Revizor, The Inspector General** (accept *The Government Inspector*)

Tossup 18: Math (Other) -- Computational (30 Seconds)

Find the cardinality of the intersection of two sets if the first set is the set of prime numbers below 20, and the second set is the set of prime numbers above 10.

Answer: **4**

Bonus 18: Social Studies (World History)

Answer the following about Alexander the Great.

A: This man was Alexander's father. He conquered Greece and probably planned to add more lands to his kingdom, but was assassinated before he could do so, possibly at the instigation of Alexander himself.

B: This was the military innovation which led to much of Alexander's success. It consisted of massed heavy infantry armed with pikes.

C: This king of Persia was one of Alexander's greatest foes. After losing his empire to Alexander, he was betrayed and murdered by one of his generals.

D: Alexander's final campaign took him into India; however, his troops mutinied on the banks of a river and refused to proceed any farther. Name this river, the eastern boundary of Alexander's conquests.

Answers: A: **Philip II of Macedon** B: **Phalanx** C: **Darius III** D: **Hyphasis River (also accept Beas River)**

Tossup 19: Literature (Literature)

The Duke of Gloucester causes the death of his brother the Duke of Clarence and subsequently marries Lady Anne. He goes on to imprison his brother Edward's sons in the Tower of London and seizes power with the Duke of Buckingham's help. At the conclusion of the play, Richmond succeeds and becomes Henry VII and in marrying Elizabeth, effectively ends The War of the Roses. Identify this Shakespearean play which sees the title character defeated at Bosworth Field while proclaiming, "A horse, a horse, my kingdom for a horse!"

Answer: **Richard III**

Bonus 19: Science (Physics)

Given a physical unit, say what it measures. For example, if I say meters, you say length.

A: Hertz.

B: Newton.

C: Henry.

D: Pascal.

Answers: A: **Frequency** B: **Force** C: **Inductance** D: **Pressure**

Tossup 20: Social Studies (World History)

Although he never learned how to write, he encourage learning and the arts, extending patronage to scholars including Alcuin. He was certainly a more able warrior, subduing Saxony, Bavaria, and much of Italy. However, one of the more famous tales involving him deals with one of his defeats in a campaign against the Basques, who ambushed his army's van in Roncevaux Pass and killed one of his knights, Roland. Name this son of Pepin the Short, who was crowned on Christmas Day of 800 A.D. as the first Holy Roman Emperor.

Answer: **Charlemagne (also accept Charles the Great or Carloman)**

Bonus 20: Literature (Literature)

Answer these questions about plays that reject realistic plots and characters and are often called the Theatre of the Absurd.

A: This Romanian is considered the foremost Absurd playwright with works like *Rhinoceros* in which the town drunk is the only villager not to transform into a giant quadruped.

B: Samuel Beckett wrote several Absurd masterpieces including *Endgame*, *Krapp's Last Tape*, and this play about Vladimir and Estragon who try to pass the time until their friend arrives.

C: Several of this playwright's early works, like *The Zoo Story* and *The Sandbox*, can be called Absurdist.

D: This author wrote many plays, including *The Birthday Party* and *The Homecoming*.

Answers: A: **Eugene Ionesco** B: **Waiting for Godot** (accept *En attendant Godot*) C: **Edward Albee**

D: **Harold Pinter**

TIEBREAKERS/REPLACEMENTS:**Tossup: Literature (Literature)**

The bridge over which this man often crossed to court his future wife, Boston Bridge, is now named after him. One of his more famous works begins with the line "By the shores of Gitche Gumee" and is about an American Indian in love with Minnehaha. Name this American writer of *The Song of Hiawatha* and *Evangeline*.

Answer: **Henry Wadsworth Longfellow**

Bonus: Science (Chemistry)

Answer these questions related to one of chemistry's great unsung heroes: Carl Wilhelm Scheele (*SHAY-luh*).

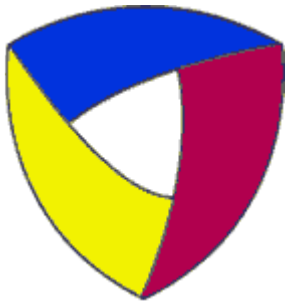
A: Scheele invented an arsenic-containing pigment of this color, which replaced older dyes made with copper carbonate.

B: He was the first to identify prussic acid, a compound of hydrogen and this deadly anion.

C: His method for mass-producing this element allowed Sweden to become one of the world's leading producers of matches.

D: Although Joseph Priestley usually gets the credit, Scheele was the first to isolate this vital gas.

Answers: A: **Green** B: **Cyanide** (also accept *CN-* or *CN1-*) C: **Phosphorus** D: **Oxygen**



Aegis Questions

**District 207 Championship 2008
Varsity Round 2**

Tossup 1: Math (General)

Hundreds of proofs for this have been proposed, including one by James Garfield. It has been generalized by Edsger Dijkstra using the signum function, for acute and obtuse triangles as well. A specific case of the law of cosines, name this theorem which states that the sum of the squares of the legs of a right triangle is equal to the square of the hypotenuse.

Answer: **Pythagorean theorem**

Bonus 1: Miscellaneous (Entertainment)

Hello, Miss American Pie. Answer these questions regarding the famous song, which chronicles a number of important events in the history of American rock and roll.

A: The death of this man, along with Ritchie Valens and the Big Bopper on the third of February, 1953, marked "the day the music died."

B: This man wrote the song "American Pie".

C: The writer of American Pie referred to this man, who later died at his home in Memphis Tennessee.

D: Referred to as the jester in the course of the song, this musician has gone on to have a very successful career, even winning an Oscar for his song "Things Have Changed" from the film "Wonder Boys".

Answers: A: **Buddy Holly** B: **Don McLean** C: **Elvis Presley** D: **Bob Dylan**

Tossup 2: Literature (Literature)

He wrote many stories involving Blandings Castle and created whimsically named characters such Pongo Twistleton and Gussie Fink-Nottle. However, his most famous duo consists of a bumbling specimen of the English upper class and a perfect valet who is always getting his master out of scrapes. Name this 20th century British author who created Bertram Wilberforce Wooster and Reginald Jeeves.

Answer: **Pelham Grenville Wodehouse**

Bonus 2: Social Studies (Geography)

Islands have often changed hands in return for money throughout history. Provide the requested answers regarding the sale or trade of various islands.

A: Peter Minuit purchased this island from local indians for approximately sixty guilders worth of various trade goods.

B: Ten Pound Island, so named for its purchase price, sits at the exit from Gloucester (GLOSS-ter) harbor, located in this New England state.

C: The Robinson family purchased this island from the Hawaiian government for ten thousand dollars in the nineteenth century.

D: Napoleon traded land in Europe for Louisiana in order to grow food for plantations on this island, a plan which came undone when the island rose up in revolution.

Answers: A: **Manhattan Island** (*Do not accept New York*) B: **Massachusetts** C: **Niihau** D: **Hispaniola**

Tossup 3: Science (Chemistry)

Flocculation is the process in which clumps are formed by the suspended particles in these. Those particles, by definition, must be between 1 and 100 nanometers large. They often scatter light, an effect called the Tyndall effect. These mixtures can be classified by their continuous and dispersed media, and examples include aerosols, foams, and emulsions. Name these homogeneous mixtures discovered by Thomas Graham.

Answer: **Colloid**

Bonus 3: Fine Arts (Music)

Given an opera, name the language it was originally written in.

A: Tristan and Isolde

B: The Barber of Seville

C: Samson and Delilah

D: Dido and Aeneas

Answers: A: **German** B: **Italian** C: **French** D: **English**

Tossup 4: Math (Geometry) -- Computational (30 Seconds)

You want to find the total number of squares of any dimension on a mini, 5x5 chess board. You can see that the board has 25 1x1 squares and 1 5x5 square, and there is a pattern involved in counting the squares of dimensions between 1x1 and 5x5.

Answer: **55 squares**

Bonus 4: Literature (Literature)

Identify the authors of the following works from the "Age of Johnson" in Britain.

A: The Vicar of Wakefield

B: The Rivals

C: Elegy Written in a Country Churchyard

D: Tristram Shandy

Answers: A: **Oliver Goldsmith** B: **Richard Sheridan** C: **Thomas Gray** D: **Laurence Sterne**

Tossup 5: Social Studies (World History)

Felix Manz became the first Anabaptist one in 1527. Michael Servetus was made one by the Calvinists in 1553. There were 40 recognized ones in England between 1535 and 1679, though Queen Mary certainly made many more. Severe persecutions produced at least 8000 of them in Korea in the 19th century, and another 22 in Uganda. Saint Stephen was the first after Jesus, while Saint Maximilian Kolbe (COLE-buh), who died in place of a stranger in Auschwitz, is one of the more recent. Because they were put to death for their religious beliefs, what title can be applied to all of these people?

Answer: **Martyr** (*do not accept Saint*)

Bonus 5: Science (Earth Science)

Identify these regions of the atmosphere.

A: This highest layer of the atmosphere extends from 300 to 600 miles above the earth's surface.

B: This lowest layer of the atmosphere is about 30,000 feet tall.

C: This second-lowest layer of the atmosphere contains the ozone layer.

D: Auroras are located in this charged region of the atmosphere.

Answers: A: **Exosphere** B: **Troposphere** C: **Stratosphere** D: **Ionosphere**

Tossup 6: Miscellaneous (Interdisciplinary)

This 1977 film, created by a husband-wife team better known for their furniture making, is narrated by Phil Morrison. The entire film centers on a picnic in Chicago's Burnham Park, though about half of it takes place at considerable distance. Identify this film, added to the Library of Congress' National Film Registry in 1998, and subtitled "A film dealing with the relative size of things in the universe and the effect of adding another zero".

Answer: **Powers of Ten**

Bonus 6: Math (Calculus)

Find the definite integrals of the following with respect to x, from x equals 1 to 2.

A: x squared.

B: sine of pi x.

C: One over x squared.

D: One over the quantity 3 minus x.

Answers: A: **7/3** B: **-2/pi** C: **1/2** D: **natural log of 2**

Tossup 7: Fine Arts (Visual Art)

The death of this artist's sister, Sophie, is depicted in Death in the Sickroom, which is part of his Frieze of Life. Other paintings in that work include The Storm and Vampire. The background of his most famous work is said to be a depiction of the vivid skies produced by the 1883 eruption of Krakatoa. That work has been stolen twice, including once during the Olympics going on in this man's native Norway. Name this artist who painted The Scream.

Answer: **Edvard Munch** (*MOONK*)

Bonus 7: Science (Physics)

Identify these standard symbols borrowed from the Greek.

A: This symbol from mechanics identifies the coefficient of friction.

B: A dielectric constant in a capacitor carries this Greek letter.

C: Angular velocity uses this symbol in rotational kinematics.

D: The density of an object is expressed by this letter.

Answers: A: **Lowercase Mu** B: **Lowercase Kappa** C: **Lowercase Omega** D: **Lowercase Rho**

Tossup 8: Social Studies (Other)

Anthropologists no longer consider this an especially primitive phenomenon since it is far more prevalent in agrarian societies. When done by a person's relatives, usually out of respect, the prefix "endo-" is added to this custom. It can quickly turn the disease kuru (*KOO-roo*) into an epidemic and prospector Alferd Packer was said to excel at it. It has occurred many times in America out of necessity, most notably at Jamestown and the Sierra Nevada when the Donner Party became trapped by a blizzard. Possibly named inaccurately after a Caribbean tribe, identify this practice that involves eating "long pork," better known as people.

Answer: **Cannibalism** (accept *anthropophagy*)

Bonus 8: Literature (Mythology)

Answer the following about a mythical shield, the Aegis.

A: In the center boss of the Aegis as depicted in Greek mythology is this creature's head.

B: According to some legends, it is made of the skin of this goat who suckled Zeus when he was a child.

C: According to Egyptian mythology, the goddess Bast is depicted holding it, with the head of this animal in the center.

D: The Aegis in Greek myth is outlined with these animals.

Answers: A: **Medusa** (prompt on *Gorgon*) B: **Amalthea** C: **Lion** D: **Snake(s)**

Tossup 9: Literature (Literature)

Many of this man's works were influenced by travels he took. Visits to Europe influenced his *Innocents Abroad*, while trips through western America contributed to his *Roughing It*. This writer, who was born in and died in years marked by Halley's Comet, also wrote works such as *The Prince and the Pauper*, and created the characters Huck Finn and Tom Sawyer. Identify this American author, whose real name was Samuel Clemens.

Answer: **Mark Twain** (accept *Samuel Langhorne Clemens* before mentioned)

Bonus 9: Math (General)

Identify the following terms related to prime numbers.

A: This states that all even integers above two can be written as the sum of two primes.

B: This states that the chance of a large number x being prime is roughly equal to one over the natural log of x .

C: This simple algorithm finds prime numbers by crossing off multiples of smaller numbers.

D: This Greek mathematician proved that there are an infinite number of primes in his book *Elements*.

Answers: A: **Goldbach's conjecture** B: **Prime number theorem** C: **Sieve of Eratosthenes** D: **Euclid**

Tossup 10: Science (Biology)

During larval development they undergo a process called torsion which will allow an adult to retract its head into its mantle cavity when threatened. Hemolymph travels throughout their blood cavities, as they possess an open circulatory system. Most have one shell, though some have none.

Identify this class that contains nudibranchs, abalones, slugs and snails.

Answer: **Gastropods** (accept *gastropoda*, prompt on *Mollusks/Mollusca* before "class")

Bonus 10: Social Studies (U.S. History)

Identify these facts related to Women's Rights.

A: The Women's Rights movement was jumpstarted with this 1848 convention in New York.

B: That convention was convened by Lucretia Mott and this woman.

C: This amendment allowed for Women's suffrage.

D: Along with the answer to part B, this activist founded the National Women's Suffrage Association.

Answers: A: **Seneca Falls** B: **Elizabeth Cady Stanton** C: **19th** D: **Susan Brownell Anthony**

HALFTIME

Tossup 11: Literature (Literature)

At one point during this play, the titular character tells off one character for not insulting him creatively enough, and tells him all the different ways he could insult him. At the end of the play, he is killed by a piece of falling firewood. Earlier, he had run through enemy lines to send letters to Roxane, though he sent them as if he were Christian. Name this play about a Frenchman with a large nose by Edmond Rostand.

Answer: **Cyrano de Bergerac**

Bonus 11: Science (Chemistry)

Name these techniques in chemistry.

A: In this technique, an acid of known concentration is added to a base of unknown concentration until the base is neutralized.

B: In this technique, oxygen is removed from ores by heating the ore in air, yielding pure metal.

C: In this technique, a thin layer of metal is layered on a piece of metal by using a voltaic cell.

D: In this technique, a mixture is separated into its component parts by taking advantage of their different boiling points. As the mixture is heated, each vapor is collected and recondensed.

Answers: A: **Acid-base titration** B: **Roasting** C: **Electroplating** D: **Fractional distillation** (*prompt distillation*)

Tossup 12: Fine Arts (Music)

Dying of an aneurism in 1873, Viktor Hartmann left behind many paintings, hundreds of which were exhibited the next year in St. Petersburg. This work was written by his good friend in tribute, a suite of ten piano pieces which include movements based on paintings such as The Catacombs and The Great Gate of Kiev. Name this aptly-titled work by Modest Mussorgsky.

Answer: **Pictures at an Exhibition**

Bonus 12: Social Studies (Geography)

It's time for a quick tour of the cities of the Emerald Isle. Given a description of an Irish city, name it.

A: Bloomsday, a commemoration of the events of James Joyce's "Ulysses", takes place in this Irish city each June.

B: It's no surprise that this town was renamed Cobh (COVE) after Irish Independence in 1922. It was also the Titanic's last port of call in 1912.

C: This Western city shares its name with a famous floutist from Northern Ireland. It also sits on a bay made famous in song.

D: Home of the Harlann and Wolff shipyards, it is the largest city in British-controlled Northern Ireland.

Answers: A: **Dublin** B: **Queenstown** C: **Galway** D: **Belfast**

Tossup 13: Math (Other) -- Computational (30 Seconds)

One-fourth of all widgets malfunction after production. If 3 widgets are inspected, what is the probability that no more than one of them malfunction? The binomial theorem will be the best formula to use to solve this problem.

Answer: **27/32**

Bonus 13: Miscellaneous (Sports)

The World Cup is one of the most legendary tournaments of any sport, but it has also had its dark moments. Answer the following about World Cup controversy.

A: In the 2006 World Cup Final, this legendary Frenchman headbutted Italian Marco Materazzi during extra time and was ejected.

B: In the 1986 World Cup quarterfinals against England, when Diego was asked how he scored his first of two goals, he claimed that it was "a little of his head and a little of" this.

C: France were beating this country 3-1 in the group stages of the 1982 Cup and had apparently scored a fourth before Prince Fahid came on the field and made the referee disallow the goal.

D: In the 1982 semifinal against France, this West German goalkeeper's airborne assault left Patrick Battiston with damaged vertebrae, but no foul was awarded.

Answers: A: **Zinedine Yazid Zidane** (*prompt on Zizou*) B: **the hand of God** (*accept la mano de Dios*) C: **Kuwait** D: **Harald 'Toni' Schumacher**

Tossup 14: Social Studies (Geography)

This island is one of the largest in the world, yet it is roughly the size of California in total area. It is easily the most linguistically diverse region in the world with over 700 distinct languages. The western side of this island was formerly called Irian Jaya. There are many artifacts from WWII scattered across the mountains and jungles of this island. Give the name of this island found north of Australia.

Answer: **New Guinea** (*do not accept Papua New Guinea, a country on the island. Indonesia owns the other half.*)

Bonus 14: Literature (Literature)

Given a description, identify the famous muckraking journalist.

A: This native of Denmark portrayed inner city slums in his How the Other Half Lives.

B: This man wrote about Jurgis Rudkus, who works in the meatpacking industry, in The Jungle.

C: This woman wrote about the plight of American Indians in A Century of Dishonor.

D: The History of the Standard Oil Company was written by this female author.

Answers: A: **Jacob Riis** (*REES*) B: **Upton Sinclair** C: **Helen Maria Hunt Jackson** D: **Ida Minerva Tarbell**

Tossup 15: Miscellaneous (Entertainment)

This Made for TV movie won John Williams an Emmy for composing the score. Julie Andrews' stepdaughter, Jennifer Edwards, made her debut performance in the title role. David Brinkley interrupted its showing to make a public apology, and thus resulted two historic changes. One change called for a special phone to be installed in the control room for executives to use, and the second was a contractual change between the TV networks and major sports organizations. Identify this film which infamously was shown right on time at seven P.M. eastern time on November 17, 1968, much to the chagrin of Oaklanders and New Yorkers.

Answer: **Heidi**

Bonus 15: Math (Other)

Given one or two binary numbers and a bitwise operator, find the new binary number.

A: NOT 1010

B: 1110 AND 0111

C: 1000 OR 0101

D: 1010 XOR (*x-or*) 0110

Answers: A: **101** (*accept 0101*) B: **110** (*accept 0110*) C: **1101** D: **1100**

Tossup 16: Science (Physics)

While this quantity can vary depending on the cross-sectional area and dimensions of an object, it is proportional to the ratio of the electric field to the current density within a material. It varies with temperature, and, according to Ohm's Law, is equal to voltage divided by current. Name this quantity signified R which is the reciprocal of conductance, and is measured in ohms.

Answer: **Electrical resistance**

Bonus 16: Social Studies (World History)

Given some details about a shipwreck, name the ship which sank, capsized, or burned.

A: This French liner, famous for its speed and Art Deco elegance, was being converted into the troopship Lafayette when it caught fire and burned in New York harbor in 1942.

B: While rounding the coast of Ireland in May of 1915, a U-Boat torpedoed this vessel of the Cunard line, named after a Roman province located in Iberia.

C: The liner Stockholm, steaming through a heavy fog off Nantucket, crashed into and sank this Italian liner.

D: 844 people died when this Great Lakes steamer capsized in the Chicago River in July 1915 between Clark and LaSalle streets.

Answers: A: **Normandie** B: **Lusitania** C: **Andrea Doria** D: **S.S. Eastland**

Tossup 17: Literature (Literature)

It was first published anonymously in May 1712 in Lintot's Miscellany. Based on the real life story of Arabella Fermor and her suitor, Lord Petre, this work actually carries the distinction of being the source for the names of the three moons of Uranus not named for Shakespearean characters. Two slyphs, Ariel and Umbriel attempt to protect Belinda, but do not succeed. A mock-heroic narrative about a stolen chunk of hair, identify this most famous work of Alexander Pope.

Answer: **The Rape of the Lock**

Bonus 17: Fine Arts (Visual Art)

Answer the following about medieval cathedral design.

A: This term was often applied to the rounded east end of the cathedral, often behind the high altar.

B: This is the central aisle from the west end of the cathedral to the high altar.

C: This was the term applied to the "arms" of the cross which gave the floor plan its cruciform shape.

D: This term applied to the upper level of the answer to number 2, and is where one often found the windows.

Answers: A: **Apse** (*accept ambulatory*) B: **Nave** C: **Transept** D: **Clerestory** (*clear-story*)

Tossup 18: Math (Calculus) -- Computational (30 Seconds)

Find the ordered pair of the coordinates of the minimum of the function f of x equals $5x$ squared minus $30x$ plus 60 .

Answer: **(3, 15)**

Bonus 18: Science (Biology)

Identify these hormones.

A: This hormone secreted by the pancreas lowers blood sugar levels.

B: This hormone secreted by the pituitary gland stimulates the kidneys to absorb more water back into the body.

C: This hormone secreted by the thyroid monitors the level of calcium in the blood.

D: This hormone secreted by the adrenal glands is an important part of the "fight or flight" response, and prepares the body for action.

Answers: A: **Insulin** B: **Antidiuretic hormone** (accept *ADH* or *vasopressin*) C: **Calcitonin** D: **Adrenaline** (accept *epinephrine*)

Tossup 19: Social Studies (Current Events)

This man took part in a revolution of the late 1970s, and later joined the Revolutionary Guards, a group created by Ayatollah Khomeini. He has said that the Holocaust is a myth, as well as saying that Israel should be "wiped off the map." Elected in 2005, his term runs out in 2009. Name this President of Iran.

Answer: **Mahmoud Ahmadinejad** (*ah-muh-DEE-nuh-jahd*)

Bonus 19: Literature (Literature)

Given a description, identify the work by E.M. Forster.

A: The title of this novel is taken from a work by Alexander Pope and follows the travels of Lilia Herriton in Italy.

B: Dr. Aziz is accused of raping of Adela Quested in this novel filled with racial tensions.

C: Lucy Honeychurch and Charlotte Bartlett complain about their accommodations at The Bertolini in this work.

D: Forster didn't want to publish this work because of its homosexual themes.

Answers: A: **Where Angels Fear to Tread** B: **A Passage to India** C: **A Room with a View** D: **Maurice** (*MOR-riss*)

Tossup 20: Science (Biology)

Produced in the microsporangium of a plant, this has a thick two-layered wall. Anemophilous (*uh-NEM-oh-FIL-us*) plants, especially non-flowering ones, rely on wind to distribute it. Flowering plants, on the other hand, use insects. If it lands on the stigma of another plant, a tube grows out of it that deposits sperm cells into the other plant, fertilizing it. Name these small grains produced by plants, which are used to fertilize other plants.

Answer: **Pollen**

Bonus 20: Math (Calculus)

Find the derivatives of the following functions, evaluated at x equals 2.

A: Sine of the quantity πx .

B: x squared minus $3x$.

C: The natural log of the natural log of x .

D: The inverse sine of the quantity x over 3.

Answers: A: π B: 1 C: $1 / (2 \ln 2)$ D: $\sqrt{5} / 5$

TIEBREAKERS/REPLACEMENTS:**Tossup: Science (Physics)**

Light passing through one of these can move as slowly as 17 meters per second. Certain substances turn into these at the temperature where their specific heat capacity approaches infinity, which is called the lambda point. 2.17 Kelvins is the lambda point for helium, the most common one of these. Name this phase of matter which has no viscosity, and can flow without any resistance.

Answer: Superfluid

Bonus: Social Studies (World History)

Given the year, and the nationality of the army in question, name the capital city which they captured and sacked.

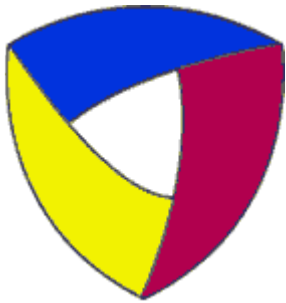
A: United States of America, 1865.

B: Ottoman Empire, 1453.

C: Holy Roman Empire, 1527.

D: Spain, 1521.

Answers: A: Richmond B: Constantinople C: Rome D: Tenochtitlan



Aegis Questions

**District 207 Championship 2008
Varsity Round 3**

Tossup 1: Science (Biology)

Coined in 1932 by Walter Cannon, this term can be achieved either by conformation or regulation. The Gaia hypothesis states that the entire Earth maintains this. Endotherms partially accomplish it through internal regulation of body temperature. Other methods include positive and negative feedback mechanisms. Identify this term referring to the stability of an organism's internal environment.

Answer: **Homeostasis**

Bonus 1: Math (Calculus)

Answer the following involving the quantity x minus 1.

A: When the quantity is raised to the fourth power, what is the sum of the absolute value of the coefficients of the terms in the expansion?

B: When the quantity x squared plus $2x$ minus 3 is divided by the quantity x minus 1, a removable discontinuity is created. What is the ordered pair of this discontinuity?

C: When the quantity is graphed, what is the area of the region bounded by the graph and the x and y axes?

D: What is the indefinite integral of the quantity?

Answers: A: **16** B: **(1, 4)** C: **1/2** D: **One-half x squared minus x plus c**

Tossup 2: Fine Arts (Music)

This friend of Mahler and Mann, an Austrian born in 1874, is often associated with the expressionist movement. After moving to the US in 1933, he became a teacher of composers such as John Cage. He is best known for works like Verklarte Nacht and Pierrot Lunaire. Name this composer, who pioneered the use of dodecaphony.

Answer: **Arnold Schoenberg**

Bonus 2: Social Studies (Geography)

You know you've made it big when someone ends up naming an entire country after you, and even if they eventually change the name, it's still quite an honor. Given a description of a nation, respond with the name of the person for whom the nation is named.

A: One of two landlocked South American nations, it is named for a South American leader in the fight for independence from Spain.

B: This Asian nation received its name in honor of the King of Spain at the time, before the discoverer, Magellan, was killed by natives.

C: Located on the coast of the Caribbean Sea, this nation's name is derived from a famous European explorer.

D: Until Zimbabwe's changeover in power from whites to blacks, this African nation was named for a British mining magnate and politician.

Answers: A: **Bolivia** B: **The Philippines** C: **Colombia** D: **Rhodesia (Accept Southern Rhodesia, do not accept Northern Rhodesia)**

Tossup 3: Math (Calculus) -- Computational (30 Seconds)

Find dy/dx at x equals 0 of the inverse cosine of $3x$.

Answer: **-3**

Bonus 3: Literature (Literature)

Given a description, identify the Nobel Laureate.

A: This 1988 winner is most famous for his Cairo Trilogy.

B: This Colombian wrote both *Love in the Time of Cholera* and *One Hundred Years of Solitude*.

C: This author of *Doctor Zhivago* refused to accept the award.

D: This Nigerian author of *The Strong Breed* and *Death and the King's Horseman* won in 1986.

Answers: A: **Naguib Mahfouz** B: **Gabriel García Márquez** (*prompt on either García or Márquez*) C:

Boris Leonidovich Pasternak D: **Akinwande Oluwole "Wole" Soyinka**

Tossup 4: Literature (Mythology)

She is a late addition to mythology, appearing only in Virgil's *Georgics* and Ovid's *Metamorphoses*.

The daughter of Idmon of Colophon, who was a famous wool dyer in Tyrian purple, she had a son by the name of Closter, who assisted her in her trade. Her most famous production involved the portrayal of 21 scenes of divine infidelity. Identify this mythological character who challenged Athena to a weaving contest, and after her victory was turned into a spider.

Answer: **Arachne**

Bonus 4: Science (Physics)

Assume gravity is equal to ten meters per second squared. A 20 kilogram object is launched at 48 meters per second, at an angle of 60 degrees above the horizontal.

A: This is the x-component of the projectile's velocity.

B: At the moment of launch, this is the projectile's momentum.

C: The projectile possesses this amount of energy at a point three meters above the ground.

D: This is the maximum height attained by the projectile. Round your answer to the nearest meter.

Answers: A: **24 meters per second** B: **960 Newton-seconds** (*or kilogram-meters per second*) C:

23,040 Joules D: **115 meters**

Tossup 5: Social Studies (U.S. History)

Later in his life, he published a work on lifting barges over hills using hydraulic power. He is more known for his diplomatic career, however, which started in Russia. Immensely popular in rural America, he began recruiting a militia in order to attack Florida and started to capture British ships using privateers, which angered the American government. Eventually recalled to France to be executed but spared by Washington, name this diplomat who was France's official ambassador from 1793 to 1795.

Answer: **Citizen Genet** (*accept Edmond Charles Genet*)

Bonus 5: Math (Geometry)

Identify these terms that describe parts of other figures.

A: This is one half of a double cone.

B: This is one half of a hyperbola.

C: This is a cone whose top is cut off parallel to its base.

D: This is a portion of a sphere, cut off by a plane.

Answers: A: **Nappe** B: **Branch** C: **Frustum** D: **Spherical cap**

Tossup 6: Literature (Literature)

Eventually published in 1678, the author began this work while in the Bedfordshire county jail for violating the Conventicle Act. Divided into two parts, the second of which tells the story of the main Christiana and her children along with the maiden Mercy. A Christian allegory that also follows an everyman character conveniently named Christian, identify this work by John Bunyan.

Answer: **The Pilgrim's Progress from This World to That Which Is to Come**

Bonus 6: Science (Astronomy)

Name these terms related to astronomy.

A: The first kind of telescope, this consists of lenses which magnify the image.

B: Not long after the invention of the telescope, this kind was introduced, which prevents chromatic aberration by using curved mirrors instead of lenses.

C: This type of rotating neutron star emits a beam of radiation toward the earth at highly regular intervals.

D: Cepheid variables and other objects with known luminosity can be used to determine how far away other objects are, because all objects appear dimmer at a distance. Such objects with known luminosity are often called this.

Answers: A: **Refracting telescope** B: **Reflecting telescope** C: **Pulsar** D: **Standard candle**

Tossup 7: Miscellaneous (Interdisciplinary)

This island, currently owned by Haiti and located off its northern coast, was found on Columbus' Second voyage, and named for its resemblance to a tortoise. Because it was not wholly controlled by a major power, it became a neutral port that was a haven for buccaneers until the 1680s. In Rafael Sabatini's Captain Blood series, the island features prominently, though younger fans will identify it as the "last free port" used by Jack Sparrow to recruit a crew whenever he needs one. Identify this infamous home to both real and fictional pirates of the Caribbean.

Answer: **Isla Tortuga** (accept *Ile de la Tortue*)

Bonus 7: Literature (Literature)

Identify these facts related to Virginia Woolf.

A: Woolf was a member of this collection of authors, which included John Maynard Keynes and Lytton Strachey.

B: Woolf authored this novel, about the Ramsay family.

C: This stream of consciousness novel is about a woman named Clarissa following World War I.

D: This essay explores the possibility of women being able to write great works of literature.

Answers: A: **Bloomsbury Group** B: **To the Lighthouse** C: **Mrs. Dalloway** D: **A Room of One's Own**

Tossup 8: Math (Algebra) -- Computational (30 Seconds)

Find the sum of the three complex roots of the equation $x^3 - 3x^2 + 4x - 2 = 0$.

Answer: **3**

Bonus 8: Social Studies (Geography)

Answer these questions about everyone's favorite Southeast Asian nation, Cambodia.

A: This city is the capital of Cambodia.

B: This U.S. President ordered secret bombing missions against targets in this country barely two months after the beginning of his presidency.

C: This was the name of this nation's communist party, which ruled the country for four bloody years, 1975-79.

D: This man, whose real name is Saloth Sar, led Cambodia in the late 1970s.

Answers: A: **Phnom Penh** (*peh-NAM PEN*) B: **Richard Nixon** C: **Khmer Rouge** D: **Pol Pot**

Tossup 9: Social Studies (World History)

This torpedo bomber saw active duty service from 1934 to May 1945, a remarkable longevity derived in some part from the lack of enemy fighters to oppose it in combat. Squadrons of this plane launched successful attacks on the Bismarck and the Italian fleet base at Taranto. Name this British biplane, whose name is derived from a sportfish.

Answer: **Swordfish**

Bonus 9: Fine Arts (Visual Art)

Some say the British Museum does not charge admission because they stole many of the great pieces within. Given the name of the piece within the British Museum, state the nation which has laid claim to it.

A: The Elgin Marbles

B: The Rosetta Stone

C: Benin Bronzes

D: Tazmanian Ashes

Answers: A: **Greece** B: **Egypt** C: **Nigeria** D: **Australia**

Tossup 10: Science (Earth Science)

It contains a high level of iridium, supporting the Alvarez hypothesis that the corresponding extinction event was due to a meteor hitting the earth. In geologic time, this location is the boundary between the Mesozoic Era and the Cenozoic Era, and occurred 65.5 million years ago. Identify this rock stratum which corresponds to the boundary between the Cretaceous and Tertiary Periods.

Answer: **K-T boundary**

Bonus 10: Miscellaneous (Entertainment)

I will name a character or two from a movie. Your job is to name the movie.

A: Dread Pirate Roberts and Inigo Montoya

B: Stanley and Stella Kowalski

C: Scout and Boo Radley

D: Captain Quint, captain of the boat named Orca

Answers: A: **The Princess Bride** B: **A Streetcar Named Desire** C: **To Kill a Mockingbird** D: **Jaws**

HALFTIME

Tossup 11: Miscellaneous (Entertainment)

He was a lieutenant in the Special Forces Unit called "Black Light", and received two Purple Hearts, serving in Leningrad, where he lost his right eye, and Siberia during the Third World War. After leaving the military, he turned to crime. Assumed dead after a botched 1993 bank heist in Kansas City, we first see him after his 1997 arrest for trying to break in to the Federal Reserve in Denver. As he arrives to carry out his sentence at the New York Maximum Security Prison, he is given a chance at a pardon if he can rescue the President who is now being held hostage on Manhattan. Name this iconic man in black, who escaped from New York and Los Angeles, twice played by Kurt Russell.

Answer: **S. D. Robert Bob "Snake" Plissken**

Bonus 11: Literature (Literature)

Given a brief description, name these British Nobel Laureates in Literature.

A: This first British winner of the Prize wrote about how the elephant got its trunk in his Just So Stories, but is more famous for creating Baloo the Bear, Bagheera the Panther, and Shere Khan the Tiger in The Jungle Book.

B: This Irish poet won the Prize in 1923 for works such as "The Second Coming" and "The Lake Isle of Innisfree".

C: This playwright won the 1925 Prize for a body of work which included The Devil's Disciple, Major Barbara, and Pygmalion.

D: This winner of the 1932 Prize wrote the Forsyte Saga.

Answers: A: **Rudyard Kipling** B: **William Butler Yeats** C: **George Bernard Shaw** D: **John Galsworthy**

Tossup 12: Literature (Literature)

One of the central questions of this play is how the main character found the money to pay for a trip to Italy; that question is raised by Krogstad, a lawyer who had worked with her husband. They had taken that trip because the protagonist's husband, Torvald, had fallen ill. Name this play in which Nora Helmer walks out on her family, written by Henrik Ibsen.

Answer: **A Doll's House** (accept *A Dollhouse* or *Et dukkehjem*)

Bonus 12: Math (Calculus)

Answer the following regarding calculus and the equation $X^2 + Y^2 = 25$.

A: Name the most specific type of figure defined by this equation.

B: Give the distance between the x-intercepts.

C: Find dy/dx .

D: Find an equation in point-slope form of the tangent line at (4,3).

Answers: A: **Circle** B: **10** C: **$-x/y$** D: **$y=-4/3*(x-4)+3$** (accept $y-3 = -4/3*(x-4)$)

Tossup 13: Social Studies (Geography)

Alexander the Great used it in 326 B.C, marking its first use by a Western army. Since then, the armies of the Mongols, Turks, and Mughals have used it, marching through a gap in some places no more than three meters wide. Name this strategically important pass, located in the Hindu Kush on the border between Afghanistan and Pakistan.

Answer: **Khyber Pass**

Bonus 13: Science (Chemistry)

Identify these chemical processes named after scientists.

A: In this process, nitrogen and oxygen are combined to create ammonia.

B: In this process, ammonia is converted into nitric acid.

C: In this process, molten alumina is purified into aluminum metal.

D: In this process, molten sodium hydroxide is separated into sodium metal.

Answers: A: **Haber(-Bosch) process** B: **Ostwald process** C: **Hall-Heroult process** D: **Castner process**

Tossup 14: Math (General)

The Dirichlet function has a value of 0 at any of these numbers, and all transcendental numbers are this kind of number. The discoverer is said to be Hippasus, although legend says the discovery upset Pythagoras and he was drowned. The most famous examples include e, pi, and the square root of 2. Identify this type of number, which cannot be expressed as a simple fraction.

Answer: **Irrational numbers**

Bonus 14: Miscellaneous (Sports)

We're off to the races. After receiving the clues, name the horse or automobile racetrack.

A: A tragic accident at this French race course in 1955 killed over eighty spectators.

B: Seabiscuit ran to his final victory at a this racetrack in Arcadia, California.

C: Louisville Kentucky is home to this track, where the Kentucky Derby runs every May.

D: Dale Earnhardt holds the record for victories at this Florida racetrack with thirty-four.

Answers: A: **Le Mans** B: **Santa Anita Park** (accept *Santa Anita*) C: **Churchill Downs** D: **Daytona International Speedway** (accept *Daytona*)

Tossup 15: Science (Chemistry)

The strength of this is directly related to both the polarizability and amount of surface contact between the molecules involved. It is created when temporary dipole moments are formed by the random movement of electrons around an atom. The only force present between neutral atoms, identify this weakest intermolecular force, named for a German physicist.

Answer: **London Dispersion Force**

Bonus 15: Social Studies (U.S. History)

Very few American public works projects had an immense impact comparable to that of the Erie Canal. Answer these questions regarding the Erie Canal.

A: Name the governor of New York who commissioned the immense public works project and saw it through to completion.

B: Give the canal's Eastern terminus.

C: Give the canal's Western terminus.

D: Name the President in 1825, the year of the canal's completion.

Answers: A: **DeWitt Clinton** B: **Albany New York** C: **Buffalo New York** D: **John Quincy Adams** (prompt on Adams, prompt on John Adams)

Tossup 16: Fine Arts (Visual Art)

Following his split with Dankmar Adler, he entered a period of smaller projects, most notably banks in small Midwestern cities such as Grinnell, Iowa, and Owatonna, Minnesota. These banks often used his trademark materials - brick and terra cotta - which he used in combination along with his revolutionary approach to steel frames in creating some of the first skyscrapers. Name this architect, famous for the Carson Pirie Scott Store in Chicago and the Wainwright Building in St. Louis, the mentor of Frank Lloyd Wright and coiner of the phrase, "Form ever follows function."

Answer: **Louis Sullivan**

Bonus 16: Math (Algebra)

Answer the following regarding the polar coordinate system.

A: What is the area bounded by the curve $r = 4$ from π radians to $\frac{3\pi}{4}$ radians?

B: The curve $r = \cos(4\pi\theta)$ represents a rose curve with how many petals?

C: The curve $r = 4 + 3\theta$ represents what kind of curve?

D: What is the Cartesian equivalent of the polar coordinate $(-8, \frac{\pi}{6})$?

Answers: A: **2 pi square units** B: **8** C: **Spiral of Archimedes** D: **(-4 root 3, -4)**

Tossup 17: Science (Physics)

The Poynting vector represents the energy variety of this for electromagnetic energy. The electric one of this is proportional to the charge contained within the surface, according to Gauss's law. The magnetic variety is always equal to zero, meaning that there are no monopoles. Name this quantity related to a field, a scalar quantity equivalent to the surface integral of a vector field over a surface, and which is typically represented by the letter phi.

Answer: **Flux**

Bonus 17: Literature (Literature)

Identify the following people from history, all of which appeared in plays by William Shakespeare.

A: This man conquered Gaul and became Roman Emperor before being betrayed on March 15.

B: He took the Scottish throne in 1040 after killing his cousin Duncan and ruled for 17 years before being killed by his son Malcolm.

C: This king led the English armies at the Battle of Agincourt during the Hundred Years War.

D: After ruling for sixty years, this king planned to divide Britain into three kingdoms for his three daughters.

Answers: A: **Julius Caesar** B: **Macbeth** (*accept Mac Bethad Mac Findlaích*) C: **Henry V** D: **King Lear**

Tossup 18: Literature (Literature)

While at the École Normale, he met his lifelong companion, feminist writer Simone de Beauvoir. She would accompany him on many of his travels and the two would work together to flesh out the idea of "the Other," explained metaphorically in a famous quote of his: "Hell is other people." A philosopher as well as a dramatist and novelist, the last of his major philosophical works, Critique of Dialectical Reason, tried to reconcile Marxism and existentialism. Identify this French author of No Exit, Being and Nothingness and Nausea.

Answer: **Jean-Paul Sartre**

Bonus 18: Social Studies (World History)

From a description, identify the following 20th century French figures.

A: He led the Free French Movement during the German occupation and was later elected as the first president of the Fifth Republic.

B: During the Fourth Republic he served in Ramadier's cabinet, and allied his Socialist Party with the Communists to upset d'Estaing in the 1981 elections.

C: He was appointed as vice premier in 1940 under Reynaud and after the fall of France in WWII, he was made Chief of State of the Vichy government.

D: After a British loss at Picardy, he was put in charge of Allied Forces and dictated the terms of the armistice signed by the Germans.

Answers: A: **Charles De Gaulle** B: **Francois Mitterrand** C: **Henri-Philippe Petain** D: **Ferdinand Foch**

Tossup 19: Math (Other) -- Computational (30 Seconds)

You have eight beads, where four of them are yellow, two are red, and two are blue. Find the number of ways you can put them in a row, if both end beads have to be blue.

Answer: **15**

Bonus 19: Science (Biology)

Name these ways of sticking needles into people. "Voodoo" is not an answer.

A: The typical method for injecting insulin, this type of injection is administered immediately below the dermis.

B: The first polio vaccine was administered this way, as are parenteral nutritional injections, appropriately called IV feedings.

C: Many vaccines are administered this way, often into the deltoid or gluteus.

D: Occasionally this process is used, injecting directly into the bone marrow, which in turn drains into the veins.

Answers: A: **Subcutaneous injection** B: **Intravenous injection** C: **Intramuscular injection** D: **Intraosseous infusion**

Tossup 20: Social Studies (U.S. History)

This patriotic anthem is not an original work per se. The original version was entitled "John Brown's Body", and versions were sung on both sides of the American Civil War. However, by 1862 The Atlantic Monthly published new lyrics, which quickly caught on across the Northern states and became an anthem for the Union. Name this patriotic song of the Civil War era, with lyrics penned by Julia Ward Howe.

Answer: **The Battle Hymn of the Republic**

Bonus 20: Fine Arts (Music)

Give the common names of each of these musical works:

A: Dvorak's Ninth Symphony, featuring a variation on the spiritual "Going Home."

B: Mozart's 41st and final symphony.

C: Beethoven's Third Symphony, originally dedicated to Napoleon Bonaparte.

D: Tchaikovsky's Sixth Symphony. The most common English translation is "passionate," not piteous.

Answers: A: **From the New World** (accept *New World Symphony*) B: **Jupiter** C: **Eroica** D: **Pathétique**

TIEBREAKERS/REPLACEMENTS:**Tossup: Fine Arts (Visual Art)**

Some of his lesser known designs include the Ponte Maria Pia in Oporto, Portugal, and La Ruche, which can be found in Paris. He was involved in one effort to build the Panama Canal, but that project fell through. In addition, he helped design a portion of the Statue of Liberty. Name this man who designed a namesake 986 foot structure in France.

Answer: **Alexandre Gustave Eiffel**

Bonus: Literature (Literature)

Given a description, identify the work by Thomas Mann.

A: Hans Castorp seeks relief in higher altitudes in this novel.

B: Set in Lubeck, this novel about a mercantile family was Mann's first.

C: This work details the vacation Gustav von Aschenbach takes in the titular city.

D: In this work, Mann retells a popular tale in which a man sells his soul to the devil.

Answers: A: **The Magic Mountain** (accept *Der Zauberberg*) B: **Buddenbrooks** C: **Death in Venice** D: **Doctor Faustus**