

Aegis Questions

**District 207 Championship 2007
Varsity Round 1**

Tossup 1: Math (General)

Its Taylor series at $x+1$ is the Mercator series. It shows up in the integral of the tangent and cotangent of x , and its own indefinite integral is x times itself, minus x . Defined as the integral from 1 to x of dt over t , what is this function, the inverse of e to the x ?

Answer: **Natural log(arithm)** (*prompt on logarithm, accept "ln"*)

Bonus 1: Literature (Mythology)

Given an object from Norse mythology, name its owner.

A: The hammer Mjolnir (*MEEOHL-neer*), which can shatter mountains with a single blow.

B: Draupnir, a gold arm ring that spawns eight golden arm rings every nine days.

C: Skidbladnir, a ship that can fold up into a pocket.

D: Brisingamen, a necklace that grants its wearer irresistible charm.

Answers: A: **Thor** B: **Odin** (*or Wotan*) C: **Freyr** (*or Frey; not Freya*) D: **Freya** (*not Freyr/Frey*)

Tossup 2: Social Studies (World History)

In 1964, he became prisoner number 46664 on Robben Island, charged with sabotage as a member of the ANC. There, he wrote his autobiography, *Long Walk to Freedom*. After a long international campaign, President de Klerk finally released him in February 1990. In 1994, however, this man finally saw his dreams come true as he was elected President in his country's first democratic elections with universal suffrage. Name this man who remained President until 1999, five years after the apartheid (*uh-PAR-tide*) was lifted from his country of South Africa.

Answer: **Nelson Mandela**

Bonus 2: Miscellaneous (Sports) -- Five Parts

Before the New York Mets and Los Angeles Dodgers had even played the first game of their first round playoff series, five MLB managers lost their jobs. Name them from their descriptions.

A: This manager of the Cubs was let go after four years, including the first Cubs playoff series win since 1908.

B: This manager of the Marlins had disagreements with upper management and was fired. He ended up winning the NL Manager of the Year award.

C: This manager of the Giants was almost twice as old as his players, including his son, 40-year-old Moises. San Francisco decided to go in a younger direction. First name is required for this answer.

D: This manager of the Washington Nationals broke the color barrier for managers in 1975 after hitting 586 home runs as a player. His 51-year career in baseball is likely over.

E: This manager of the Texas Rangers was the last of these five to be fired. Each of the past two times he has been fired, by the Yankees and the Diamondbacks, those teams won the World Series the following year.

Answers: A: **Dusty Baker** B: **Joe Girardi** C: **Felipe Alou** D: **Frank Robinson** E: **Buck Showalter**

Tossup 3: Fine Arts (Visual Art)

The subjects are survivors of a disaster off the coast of Africa desperately seeking to be rescued. To achieve authenticity in portraying this event, the artist interviewed the actual survivors, studied corpses at the morgue, and even had a model of the makeshift lifeboat built. The results were a grotesque, yet dynamic masterpiece and a new movement of art, Romanticism. Identify this sixteen by twenty three foot painting by Theodore Gericault (*JEHR-ih-ko*).

Answer: **The Raft of the Medusa**

Bonus 3: Math (Calculus)

Find the derivatives of the following functions at x equals 1. Express any fractional answers greater than one as improper fractions.

A: F of x equals $12x$ to the fifth power minus $11x$ plus 2.

B: F of x equals $2x$ plus $9e$ to the $3x$ power.

C: F of x equals 4 times the sine of $2\pi x$ over 3.

D: F of x equals $2x$ cosine of πx over 2.

Answers: A: **49** B: **2 plus 27 e cubed** (accept "to the third power" for "cubed") C: **Negative 4 pi over 3** D: **Negative pi**

Tossup 4: Science (Chemistry)

Called a residue after a water molecule is removed, this type of molecule is defined only by having two particular functional groups, though typically they are both attached to a central alpha-carbon. Though over a hundred exist in nature, only twenty are encoded by DNA, and only a few of these are so-called "essential" ones. Name this type of biochemical molecule, the monomer building block of proteins.

Answer: **Amino acid**

Tossup 5: Literature (Language Arts)

Give the first two words. Though using it is called greeking by typesetters, it is actually a modified version of the Latin text in a speech by Cicero called "On the Ends of Good and Evil." Said to approximate an English distribution of letters, name these words used in PowerPoint and other programs as nonsense filler text, followed by "dolor sit amet."

Answer: **Lorem ipsum**

Bonus 5: Science (Astronomy)

Given the name of a moon in the solar system, name the object which it orbits.

A: Callisto

B: Proteus

C: Phoebe

D: Dysnomia, formerly known as Gabrielle

Answers: A: **Jupiter** B: **Neptune** C: **Saturn** D: **Eris** (accept 2003 UB313; prompt Xena)

Tossup 6: Social Studies (Current Events)

The first round took place from August 27th to August 29th, 2003, the second round, February 25th to February 28th, 2004, the third, June 23rd to June 25th, 2004, with subsequent rounds taking place in multiple phases over the next three years. Involving Russia, China, Japan, The US, South Korea and North Korea, the fifth round of them stalled for over a year. In that time frame, North Korea managed a successful nuclear test. Identify these meetings, which are a result of North Korea's 2003 withdrawal from the Nuclear Non-Proliferation Treaty.

Answer: **Six-party talks**

Bonus 6: Literature (Literature)

Given the author and subtitle of a popular and kind of recent work of nonfiction, give the title.

A: Steven D. Levitt and Stephen J. Dubner; A Rogue Economist Explores the Hidden Side of Everything

B: Jared Diamond; The Fates of Human Societies

C: Thomas L. Friedman; A Brief History of the Twenty-first Century

D: Malcolm Gladwell; How Little Things Make a Big Difference

Answers: A: **Freakonomics** B: **Guns, Germs, and Steel** C: **The World is Flat** D: **The Tipping Point**

Tossup 7: Math (Other) -- Computational (30 Seconds)

Find the probability that when flipping 9 fair coins, 6 will come up heads. It may help you to know that 2 to the ninth power equals 512.

Answer: 21/128

Bonus 7: Science (Biology)

Answer these questions related to everyone's favorite, the X chromosome.

A: Some men have more than one X chromosome, leading to this syndrome.

B: Some women, on the other hand, only have one X chromosome, leading to this syndrome.

C: In a process called Lyonization, all but one of the X chromosomes in every cell is deactivated and turned into one of these compact versions.

D: Nothing on the X chromosome determines femaleness. Rather, humans need one of these regions on a Y chromosome to make them male.

Answers: A: Klinefelter syndrome B: Turner syndrome C: Barr body D: SRY gene (accept sex-determining region Y)

Tossup 8: Miscellaneous (Technology)

Developed by Netscape, it is an integral part of SPA and DHTML. Most commonly used to alter the Domain Object Model of websites after they are loaded, variants can be found in programs like Adobe Photoshop, Flash, and even Reader software. The most famous dialect of ECMAScript (*ECK-muh-script*), it is responsible for Cross Site Scripting and many other modern website vulnerabilities. Name this programming language, which, though a registered trademark of Sun Microsystems, is unrelated to a similarly-named product of Sun.

Answer: JavaScript (do not accept or prompt Java)

Bonus 8: Fine Arts (Music)

Name the composers of the following twentieth-century operas.

A: Madama Butterfly

B: Lady Macbeth of the Mtsensk District

C: Dialogues of the Carmelites

D: Nixon in China

Answers: A: Giacomo Puccini B: Dmitri Shostakovich C: Francis Poulenc D: John Adams

Tossup 9: Science (Biology)

It begins when oxaloacetic (*ox-AL-o-a-SEE-tic*) acid combines with acetyl coenzyme-A to form a six-carbon molecule, and its five repeating steps generate another oxaloacetate molecule, along with two ATP, six NADH, two FADH₂, and four carbon dioxide molecules. Name this cycle in cellular respiration named after either a biologist or its starting molecule, the acid that makes lemons sour.

Answer: Krebs cycle (accept citric acid cycle)

Bonus 9: Math (Algebra)

Answer the following questions regarding series. Express all answers as decimals or fully reduced fractions.

A: What is the fifth term of the geometric series with ratio four-fifths and sum of 50?

B: What is the ratio of the infinite geometric series with first term 9 and sum 90?

C: What is the sum of the infinite series 4, 2, 1, and so on?

D: What is the sixth term of the geometric series with second term 3 and ratio of negative one-half?

Answers: A: 4.096 (4 and 12/125) B: 0.9 (9/10) C: 8 D: 0.1875 (3/16)

Tossup 10: Literature (Literature)

War is peace. Freedom is slavery. Ignorance is strength. Though Emmanuel Goldstein disagrees with the Party's slogans, his opinions are only heard during the "two minutes hate," when the citizens of Oceania boo the Party's enemies. Working in the Ministry of Truth, the protagonist helps silence opposition by rewriting history, though he later has second thoughts about Big Brother. Name this book that begins as the clocks strike thirteen, written by George Orwell.

Answer: 1984

Bonus 10: Social Studies (World History)

Identify these facts related to the French Revolution.

A: King Louis XVI called together this body to help deal with the mounting crisis. It had not convened since 1614.

B: The Third Estate was upset at being at a disadvantage at the answer to Part A, so they convened a meeting known as this.

C: This is the term for the period of the revolution that saw tens of thousands of people guillotined.

D: This director of the Committee of Public Safety was eventually guillotined himself.

Answers: A: Estates General B: Tennis Court Oath C: Reign of Terror (*prompt on radical phase*)

D: Maximilien de Robespierre (*accept Maximilien-François-Marie -Isidore de Robespierre*)

HALFTIME

Tossup 11: Fine Arts (Music)

Inspired by a 1797 German poem, its subtitle is accordingly "Scherzo after a ballad by Goethe (*GER-ta*)." Already famous, this 1897 symphonic poem gained even more notoriety after its movie performance by Leopold Stokowski. Name this piece by Paul Dukas, whose titular character is played in the film Fantasia by Mickey Mouse.

Answer: **The Sorcerer's Apprentice** (*accept L'apprenti Sorcier*)

Bonus 11: Math (General)

Calculate the following combinations in nCr form.

A: 3 C 2

B: 10 C 8

C: 6 C 3

D: 5 C 5

Answers: A: **3** B: **45** C: **20** D: **1**

Tossup 12: Literature (Literature)

A contemporary of Jack London, many of his works had characters with animalistic characteristics, which stemmed from his belief in Darwinism. He was writing the Epic of Wheat trilogy when he died, and his most famous novel was turned into a 1924 movie named Greed. Name this naturalist author of works such as The Pit and McTeague.

Answer: **Benjamin Frank(lin) Norris**

Bonus 12: Social Studies (Other)

Name the authors of the following landmark works in economics.

A: An Inquiry into the Nature and Causes of the Wealth of Nations , which decreed that an "invisible hand" controlled the marketplace.

B: The General Theory of Employment, Interest, and Money, which created much of the basis and terminology of macroeconomics.

C: Capitalism and Freedom, published in 1962, when the economic freedom it championed was under attack from Communism. The author passed away in 2006.

D: The Theory of the Leisure Class, which argued that the wealthy waste money on unnecessary items simply to give off the appearance of wealth.

Answers: A: **Adam Smith** B: **John Maynard Keynes** C: **Milton Friedman** D: **Thorstein Veblen**

Tossup 13: Science (Physics)

The elastic type is equal to one half the spring constant times displacement squared. The electric type is Coulomb's constant times the product of the charges over their distance. The gravitational type is mass times gravitational acceleration times height. Name this type of energy that indicates how much energy is stored in an object, as opposed to kinetic energy.

Answer: **Potential energy**

Bonus 13: Miscellaneous (Interdisciplinary)

Answer these burning questions.

A: This MLS team plays for the Brimstone Cup every year against FC Dallas.

B: It is a low density, relatively low temperature plasma that appears commonly on ship masts, and is caused by the ionization of the air during thunderstorms. It is also the name of a 1985 Brat Pack movie.

C: Harry Truman, Menachem Begin (*BEGG-in*), and Pope Paul VI are all mentioned in this stream-of-consciousness song.

D: This Jack London short story tells the tale of a man and his dog traveling through the Yukon.

Answers: A: **Chicago Fire** (prompt on either half) B: **St. Elmo's Fire** C: **We Didn't Start the Fire** D: **To Build a Fire**

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

Though it is only 26.6 seconds long, it is located in the National Film Registry because of its cultural significance. Its owner originally sold it to Life Magazine for \$150,000, donating \$25,000 of it to the family of J. D. Tippit. Though at least seven other films exist of the same moment, its elevated position on a concrete pedestal next to a grassy knoll made it critical evidence in the Warren Commission. Name this home video filmed at Dealey Plaza in Dallas, Texas, on November 22, 1963.

Answer: **Zapruder film**

Bonus 14: Science (Chemistry)

Name these thermodynamic measures of energy in systems.

A: The first law of thermodynamics deals with when this measure of energy is conserved, and is the sum of all molecular kinetic energy and atomic potential energy.

B: This measure of energy is typically expressed as capital H, and includes the work that the system does on the atmosphere.

C: Typically represented capital G, chemical reactions that decrease this value give off energy, and are favored.

D: Usually represented capital A, for the German for "work," it represents the amount of useful work a system can perform with constant temperature and volume.

Answers: A: **Internal energy** B: **Enthalpy** (do not accept entropy) C: **Gibbs free energy** D: **Helmholtz free energy**

Tossup 15: Math (Calculus) -- Computational (30 Seconds)

Find the coordinates of the inflection point of the function y equals x cubed minus $9x$ squared plus x minus 20 . Remember that the inflection point, or the point where concavity switches, can be found at the extrema of a first-order derivative function or the x intercepts of a second-order derivative function.

Answer: **(3, -71)** (do not accept or prompt on partial answer)

Bonus 15: Literature (Literature)

Answer these questions about books with animals in them.

A: This graphic novel about the Holocaust by Art Spiegelman depicts Germans as cats.

B: This novel by Richard Adams features a group of rabbits led away from their previous home by the rabbit Hazel.

C: This was the first of what is currently an eighteen-book series by Brian Jacques, about a group of mice and other animals at the titular abbey.

D: All of these books apply human characteristics to non-humans, a technique called this, from the Greek for "human" and "form."

Answers: A: **Maus: A Survivor's Tale** B: **Watership Down** C: **Redwall** D: **Anthropomorphism**
(accept other forms of the word)

Tossup 16: Literature (Literature)

During a storm, he claims that the bay of Lisbon was created expressly for the Anabaptist Jacques to drown in. He is a teacher of metaphysico-theologico-cosmolo-nigology, and he suffers from a sexually transmitted disease, the curing of which loses him an eye and an ear. Name this philosopher and teacher of Candide.

Answer: **Dr. Pangloss**

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

Identify these American Naval vessels, given a description.

A: Nicknamed "Old Ironsides," it is the oldest active vessel in the United States Navy.

B: An Iowa Class Battleship, this vessel served as the site of the Japanese surrender in World War II.

C: Having exploded in Havana Harbor, this ship's destruction served as the rallying cry for the Spanish-American War.

D: A Portland Class heavy cruiser, this ship carried the first atomic bomb to an air base on Tinian Island.

Answers: A: **The U.S.S. Constitution** B: **The U.S.S. Missouri** C: **The U.S.S. Maine** D: **The U.S.S. Indianapolis**

Tossup 17: Miscellaneous (Other)

Made from the camellia sinensis plant, there are many varieties, some fried, boiled, or dried before use. Though the FDA has not approved any medical indications, there are claims that it can prevent heart disease, cancer, neurodegeneration, and lower cholesterol. Name this drink of which many Asians have about 1.2 liters of each day.

Answer: **Green tea**

Bonus 17: Math (Geometry)

Find the areas of the following triangles.

A: A scalene triangle with sides of length five, six, and seven.

B: An isosceles triangle with sides of length five, five, and six.

C: A right triangle with side lengths of seven root five, fourteen, and seven.

D: An equilateral triangle with side length of four.

Answers: A: **6 root 6** B: **12** C: **49** D: **4 root 3**

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

Find the determinant of this three-by-three matrix, given from left to right, then top to bottom. 1, 3, 4; 2, 3, 4; 5, 4, 3.

Answer: **7**

Bonus 18: Literature (Literature)

Given a line by John Keats, name the poem from which it is taken.

A: "Beauty is truth, truth beauty—that is all ye know on earth, and all ye need to know."

B: "Much have I travell'd in the realms of gold, and many goodly states and kingdoms seen."

C: "My heart aches, and a drowsy numbness pains my sense, as though of hemlock I had drunk."

D: "Where are the songs of Spring? Ay, where are they?"

Answers: A: Ode on a Grecian Urn B: On First Looking Into Chapman's Homer C: Ode to a Nightingale D: To Autumn

Tossup 19: Science (Biology)

The organism must be found in all diseased animals but no healthy animals. It must be isolated from a diseased animal and grown in pure culture. That culture should cause disease when exposed to healthy animal. The organism must then be found in the experimentally infected animal. Give the collective name for these postulates named after the discoverer of the anthrax and tuberculosis bacteria, postulates that establish a link between a disease-causing organism and a disease.

Answer: **(Henle-)Koch('s) postulates**

Bonus 19: Fine Arts (Visual Art)

You may not be sure what you want to be when you grow up, but do yourself a favor and don't become a Post-Impressionist painter. Given a miserable life, name the Post-Impressionist who lived it.

A: After stalking another artist with a razor, this artist mutilated his left ear, then wrapped the lobe in newspaper and presented it to a local prostitute. Two years later, he shot himself in the chest, missed his heart, and died two days later.

B: After his decision to become artist, his wife and five children left him. Frequently struggling with depression, this artist attempted suicide after fleeing the materialism of Europe. He died in French Polynesia after enduring ten years of extreme poverty and venereal disease.

C: As a result of his family's inbreeding, this artist's legs did not heal from an injury, and he would grow no taller than four-eleven. He died at age 37 from complications of alcoholism and syphilis.

D: His paintings required such a large amount of work that he only completed seven. His family's background forced him to keep his wife and child a secret. He and his baby son died within a few weeks of each other, he at the age of 31.

Answers: A: **Vincent van Gogh** B: **Paul Gauguin** C: **Henri Toulouse-Lautrec** D: **Georges-Pierre Seurat**

Tossup 20: Social Studies (World History)

Though he took part in the Ninth Crusade, his exploits in Britain are much more well known. He sought to unite the kingdoms of Britain under one crown, and brought the Welsh under the monarchy. The inscription on his tomb describes him as the "Hammer of the Scots". Identify this English King, who is buried in a lead casket in Westminster Abbey and who moviegoers today will probably recognize as the man who fought William Wallace.

Answer: **Edward I** (accept also *Edward Longshanks*)

Bonus 20: Science (Physics)

A 2-kilogram mass is dragged with a constant force of 10 Newtons, along a surface whose coefficient of sliding friction is .1. Use 10 meters per second squared as the acceleration of gravity, and ignore significant figures.

A: What is the force of friction on the mass?

B: What is the resultant force on the mass?

C: What is the acceleration of the mass?

D: Assuming the mass actually slides, what is the maximum possible coefficient of static friction of the surface?

Answers: (prompt for units) A: **2 Newtons** B: **8 Newtons** C: **4 meters per second squared** (or meters per second per second) D: **.5** (or 1/2; has no units)

TIEBREAKERS/REPLACEMENTS:**Tossup 21: Math (Algebra) -- Computational (30 Seconds)**

Fully simplify the product of the following three log expressions. The log base two of five, times the log base three of eight, times the log base twenty-five of nine.

Answer: **1/3**

Bonus 21: Social Studies (U.S. History) -- Three Parts

Given a "deal," name the president who used it.

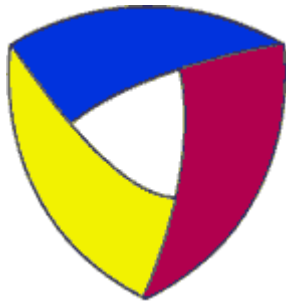
A: New Deal

B: Fair Deal

C: Square Deal

Answers: A: **F(ranklin Delano) Roosevelt** (prompt on Roosevelt; accept FDR) B: **Harry S. Truman**

C: **Theodore Roosevelt** (prompt on Roosevelt; accept Teddy Roosevelt)



Aegis Questions

**District 207 Championship 2007
Varsity Round 2**

Tossup 1: Social Studies (Geography)

Known as the "Land above the bridge," the economy of this area centers around logging and mining. To get to it, the first visiting Europeans had to cross the St. Marys River, which is on the eastern side of it. Lake Superior is to the north of it, while Lakes Huron and Michigan surround it to the south. Name this area, with inhabitants known as "Yoopers," which is the "second part" of Michigan.

Answer: **Upper Peninsula** (prompt on U.P.)

Bonus 1: Literature (Literature) -- Five Parts

Answer the following about Pulitzer Prize winning plays.

A: This play centers around the dysfunctional Tyrone family, including Mary, the mother of Edmund and a morphine addict.

B: All of the action in this play takes place on the Mayo family farm, and opens with Robert sitting atop a fence and reading.

C: At the end of this play, Nina and Darell are the only two who know who the real parents of Gordan Evans are.

D: The title character of this play is the daughter of a sailor, and her father is incensed when she falls in love with Mat.

E: All four of these plays were written by what author?

Answers: A: **Long Day's Journey into Night** B: **Beyond the Horizon** C: **Strange Interlude** D: **Anna Christie** E: **Eugene O'Neill**

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

What is the sum of the coefficients of the expansion of the quantity $3x$ plus $2y$ minus z , raised to the second power? It may help you to know that subtracting the z does cause negative signs to be part of the coefficients in the expansion.

Answer: **16**

Bonus 2: Science (Biology)

Answer these questions about the small intestine.

A: The first part of the small intestine is this, named after the Latin for "twelve," as in, "twelve inches long."

B: The middle section of the small intestine is this, named after the Old English for "hungry."

C: The final section of the small intestine, this leads into the cecum of the large intestine.

D: The small intestine absorbs nutrients through small fingerlike projections called villi, into this dense network of blood vessels surrounding the intestine.

Answers: A: **Duodenum** B: **Jejunum** C: **Ileum** D: **Mesentery**

Tossup 3: Miscellaneous (Interdisciplinary)

The last name's the same. Larry is a fan who caught Barry Bonds' 660th and 661st home runs. A different Larry was the richest man in the world for a period of time in 2000; most of his wealth stems from his ownership of the database company Oracle. Ralph became a fiction writer at Richard Wright's urging, and is famous for the novel portraying a man that people refuse to see.

Answer: **Ellison** (accept Larry Ellison before Ralph is mentioned)

Bonus 3: Social Studies (World History)

Most successful revolutions are given a name of a flower or a color, but not all. Identify these revolutions, which exemplify both.

A: This bloodless revolution saw Vaclav Havel installed as the President of Czechoslovakia on December 29, 1989.

B: This 2005 revolution involved the overthrow of President Askar Akayev and his government in Kyrgyzstan. It was given its name by Akayev himself in a speech condemning the uprising.

C: This 2004 revolution saw leader of the opposition Viktor Yushchenko declared president after the annulment and repeat of disputed elections.

D: In 2000, this revolution led to the ousting of Slobodan Milošević in Yugoslavia. Also called the October 5th Overthrow, it is named for the vehicle that one protester drove into the Serbian Broadcasting Corporation's headquarters.

Answers: A: **Velvet Revolution** B: **Tulip Revolution** C: **Orange Revolution** D: **Bulldozer Revolution**

Tossup 4: Science (Chemistry)

Its emission spectra can be described by special cases of the Rydberg equation called the Lyman, Balmer, and Paschen series. Three natural isotopes exist, the lightest being by far the most common, sometimes called "protium" to distinguish it from the other isotopes. Most economically produced by reacting methane and water to make it and carbon monoxide, name this element, the namesake anode of energy fuel cells, the lightest element with symbol H.

Answer: **Hydrogen**

Bonus 4: Math (Other)

Answer the following questions about drawers of socks.

A: A drawer has 4 red socks and 4 blue socks. How many ways can these socks be ordered in a line?

B: A drawer has 2 orange socks, 2 black socks, and 2 purple socks. What is the probability that the first two socks, drawn without replacement, will be the same color?

C: A drawer has 3 green socks, 3 mauve socks, 3 taupe socks, and 3 beige socks. What is the probability that four socks pulled with replacement will all be different colors?

D: A drawer has 10 white socks and an unknown number of yellow socks. If the probability of drawing 2 yellow socks with replacement is one-ninth, how many yellow socks are there?

Answers: A: **70** B: **1/5 or 0.2** C: **3/32** D: **5**

Tossup 5: Literature (Literature)

Most of his works are sweeping historical epics dealing with many generations of people in a particular place. His most famous work, a collection of short stories, inspired a Rogers and Hammerstein musical. Name the author of Cheseapeake, Alaska, Texas, Hawaii, and Caribbean who won the Pulitzer in 1948 for Tales of the South Pacific.

Answer: **James Michener**

Bonus 5: Fine Arts (Visual Art)

Given a Surrealist work of art, name its creator.

A: The Son of Man

B: Twittering Machine

C: Soft Construction With Boiled Beans

D: Le violon de Ingres

Answers: A: **Rene Magritte** B: **Paul Klee** C: **Salvador Dali** D: **Man Ray**

Tossup 6: Math (Calculus)

Though he did solve the brachistochrone (*bruh-KIS-tuh-krone*) problem posed by his teacher, most of his other accomplishments were actually done by his teacher, who he paid 300 francs a year to be quiet about the matter. Devoting himself to mathematics after bad eyesight prevented a military career, name this French mathematician who gets credit for Johann Bernoulli's rule that the limit of an indeterminate quotient is the limit of the quotient of the derivatives.

Answer: **Marquis de l'Hôpital**

Bonus 6: Literature (Mythology) -- Five Parts

Complete the following famous mythological pairs.

A: Pyramus

B: Castor

C: Baucis

D: Vertumnos

E: Phrixos

Answers: A: **Thisbe** B: **Pollux** C: **Philemnon** D: **Pomona** E: **Helle**

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

Born in Detroit, Michigan in 1873, he worked at a steel and wire company starting at the age of ten. After listening to the speeches of Emma Goldman, his views shifted towards anarchy, and after reading the account of the assassination of Umberto the First of Italy, he found a hero in the assassin. Name this man who moved to Buffalo, New York seven days before taking a newspaper clipping of Umberto's assassination and a pistol to the Pan American Exposition to kill William McKinley.

Answer: **Leon Czolgosz** (*CHOL-gotz; be lenient with pronunciation*)

Bonus 7: Miscellaneous (Other)

Answer these questions about humorous laws of the universe.

A: According to this famous law, what can go wrong will go wrong.

B: According to Godwin's Law, the longer an online discussion continues, the probability that somebody will be compared to this man, approaches one.

C: Hanlon's Razor states that one should never attribute to malice that which can be adequately explained by this phenomenon instead.

D: This fictional man's principle states that the most ineffective workers are moved to management, where they can do the least damage.

Answers: A: **Murphy's Law** B: **Adolf Hitler** C: **Stupidity** (*accept similar answers*) D: **Dilbert('s) Principle**

Tossup 8: Fine Arts (Music)

Upon arriving at Paris, he adopted the French name by which he is now most commonly known. Though he died of tuberculosis at age 39, he wrote many popular pieces, such as the Piano Sonata Number 2, named after its third Lento movement, as well as 27 etudes (*A-tudes*), 27 preludes, 21 nocturnes, 20 waltzes, and 57 mazurkas (*muh-ZUR-kuz*). Name this Polish composer of the Funeral March and Minute Waltz.

Answer: **Frederic Chopin**

Bonus 8: Math (Geometry)

Find the volumes of the following solids. Leave answers in terms of pi when applicable.

A: A right cylinder with diameter 10 centimeters and height 12 centimeters.

B: A prism with height 10 inches and triangular base with sides of 13 inches, 13 inches, and 24 inches.

C: A cube with a face diagonal of 10 inches.

D: A cube that is 4 centimeters on a side with a circular hole through the middle 2 centimeters in diameter.

Answers: A: **300 π cubic centimeters** B: **600 π cubic inches** C: **250 $\sqrt{2}$ cubic inches** D: **64 - 4 π cubic centimeters**

Tossup 9: Science (Physics)

Each material has a threshold frequency below which this will not occur. First observed by Becquerel, it was not well understood until a famous 1905 paper described a mathematical model for it. It is caused by electromagnetic radiation knocking an electron loose from an atom, creating a current on the surface. Name this effect that causes metals to eject electrons when light is shone on them.

Answer: **Photoelectric effect**

Bonus 9: Social Studies (U.S. History)

Name these Supreme Court cases dealing with students' rights in public schools.

A: This 1962 case ruled that state-led prayer in schools was illegal.

B: This 1969 case ruled that students had free speech in schools, allowing them to wear black armbands in protest of Vietnam.

C: This 1972 case ruled that Amish children could leave public school after 8th grade.

D: This 1984 case ruled that public school officials were allowed to conduct reasonable searches of personal belongings without warrants.

Answers: A: **Engel v. Vitale** B: **Wisconsin v. Yoder** C: **Tinker v. Des Moines Independent Community School District** D: **New Jersey v. T.L.O.**

Tossup 10: Literature (Language Arts)

A possible etymology is the Scottish word for river gravel. Though it was once a collective noun, it now refers to individual pieces. When not created properly, they might be hanging, dimpled, or pregnant. Name these circles of paper everyone was talking about during the 2000 elections, that share their name with an African country.

Answer: **Chad**

Bonus 10: Science (Chemistry)

Name each of these artificial sweeteners.

A: Possibly the most famous artificial sweetener, it can be found in NutraSweet, Equal, and Candarel.

B: This new artificial sweetener is found in Splenda.

C: This sweetener gets its name from a word meaning "sugary," and can be found in Sweet'N Low.

D: This sweetener is usually used in conjunction with other artificial sweeteners to mask their aftertaste, but can still be found alone in the product Sucaryl.

Answers: A: **Aspartame** B: **Sucralose** C: **Saccharin** D: **Cyclamate**

HALFTIME

Tossup 11: Literature (Mythology)

One side reads, "Take me up," and the other, "Cast me away." In some versions of the myth, this weapon is retrieved after another one breaks in a fight against King Pellinore. Its owner wields it for the rest of his life, and as he dies, commands Sir Bedivere to throw it back into the lake where it came from. Name this weapon whose scabbard prevents the bearer from dying of blood loss, the mystical sword of King Arthur.

Answer: **Excalibur**

Bonus 11: Math (General)

Answer the following questions about numbers in the Fibonacci sequence. For numbering purposes of this question, its first and second terms are one, and its third term is two.

A: What is the only perfect square in the sequence before the thirtieth term?

B: What is the largest number in the Fibonacci sequence less than 1,000?

C: Name all the perfect cubes in the first 20 terms of the sequence.

D: What is the tenth term?

Answers: A: **144** B: **987** C: **8** (do not accept additional answers) D: **55**

Tossup 12: Science (Astronomy)

It stretches from 30 to 50 astronomical units from the sun, because nearer objects were ejected or swept up. Objects in it have an orbital resonance with Neptune, and depending on the strength of that resonance, are called cubewanos, plutinos, or twotinos. Over 800 member objects have been discovered, most notably Ceres, Quaoar, Eris, Charon, and Pluto. Name this belt of trans-Neptunian objects in our solar system.

Answer: **Kuiper belt**

Bonus 12: Social Studies (World History)

Given a war, name the treaty that ended it.

A: Russo-Japanese War

B: First Sino-Japanese War

C: Franco-Prussian War

D: War of the Spanish Succession

Answers: A: **Treaty of Portsmouth** B: **Treaty of Shimonoseki** C: **Treaty of Frankfurt** D: **Treaty of Utrecht**

Tossup 13: Fine Arts (Visual Art)

He hated the color green so much that he went so far as to paint the leaves of an artificial tulip that he had in a vase white. After his death, his heir took his studio and made exact replicas of the pieces and organization within it, creating "The Wall Works", a portable installation. Identify this man, the central figure of the De Stijl (*DAY SHTEEL*) movement and creator of non-representational compositions such as Broadway Boogie-Woogie.

Answer: **Pieter Cornelis "Piet" Mondrian**

Bonus 13: Science (Physics)

Identify the official SI unit for each of the following quantities.

A: Pressure

B: Electrical potential

C: Radioactivity

D: Catalytic activity

Answers: A: **Pascal** B: **Volt** C: **Becquerel** D: **Katal**

Tossup 14: Social Studies (World History)

He was wounded at the Battle of Verdun and left for dead, but was captured by the Germans. In World War II, he was the only French commanding officer to force a German retreat during the invasion of France. The Vichy (*vih-shee*) French government sentenced him to death in 1940, while Churchill considered him to be the leader of Free France. Name this French leader and statesman who became leader of France following World War II and returned as President in 1958.

Answer: **Charles de Gaulle**

Bonus 14: Literature (Language Arts)

Correctly spell the following words.

A: Tintinnabulation

B: Perigee (*PAIR-uh-jee*)

C: Myrmidon (*MURR-ma-don*)

D: Reptilian

Answers: A: **TINTINNABULATION** B: **PERIGEE** C: **MYRMIDON** D: **REPTILIAN**

Tossup 15: Math (General) -- Computational (30 Seconds)

Convert the octal number (*spell out*) 6 1 2 0 into hexadecimal. It may help you to remember that eight to the third power is 256 and that sixteen to the third power is 4,096.

Answer: **C50** (*c five zero*)

Bonus 15: Miscellaneous (Technology)

Name these popular social networking websites.

A: Founded by Mark Zuckerberg, this website started at Harvard, expanded to all colleges, and in September 2005, opened to high school students as well.

B: This website allows users to design their own profile pages in HTML. Open to all people age 14 or over, this site's profiles include the standard blurbs "About Me" and "Who I'd Like to Meet."

C: This blogging website's mascot is Frank the Goat. Perhaps the best-known hosted blog service, it allows four different states of friendship between users.

D: Another popular hosted blog service, this website allows users to subscribe to other blogs, or join bloggings. Its five-letter name can be pronounced in many different ways.

Answers: A: **Facebook** B: **MySpace** C: **LiveJournal** D: **Xanga**

Tossup 16: Literature (Literature)

When we first meet him, he is a twenty-one year old hay trusser, and after he dies, in his will he stipulates that no one remember his name. Eighteen years after an infamous incident at Weydon-Piers, he becomes a successful corn merchant in the titular locale, but reflects on the past and begins competing with Donald Farfrae. Name this title character of a novel by Thomas Hardy about a man who sells his wife and child to a sailor who later enters politics.

Answer: **Michael Henchard** (*accept "The Mayor of Casterbridge"*)

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

Identify these facts related to John Brown.

A: Although he is famous for events that occurred in two other states, Brown was actually born in Torrington in this New England state.

B: In May of 1856, Brown led a group of abolitionists that killed five pro-slavery people at this Kansas location.

C: Brown and others captured an armoury at this Virginia town in 1859.

D: Brown was defeated by a unit led by this future Confederate general.

Answers: A: **Connecticut** B: **Pottawatomie Creek** C: **Harpers Ferry** D: **Robert Edward Lee**

Tossup 17: Miscellaneous (Sports)

In 1965, this team's nickname was changed to their current nickname, as the Colt Firearms Company objected to sales of souvenirs carrying the Colt name. That year was also the year they moved into the first domed stadium in Major League history, but it wasn't until the following year that they first introduced artificial turf. Name this baseball team that played in and lost its first World Series in 2005 to the Chicago White Sox.

Answer: **Houston Astros** (*prompt on either half of the name*)

Bonus 17: Science (Chemistry)

Name these intermolecular forces.

A: Named after a German physicist and not a town, these are caused by electron clouds forming temporary multipoles.

B: Stronger are these interactions, between permanent regions of slight positive or negative charge.

C: Even stronger are these bonds, formed when the namesake atom is bonded to a very electronegative atom, giving this atom a slight positive charge.

D: The weakest two of these forces are generally lumped together into this one term, a class of intermolecular forces named after a Dutch chemist.

Answers: A: **London dispersion forces** B: **Dipole-dipole interactions** (*accept Keesom interactions*) C: **Hydrogen bonds** D: **Van der Waals forces**

Tossup 18: Science (Biology)

Also known as icterus, it is caused by high concentrations of bilirubin, which forms from the breakdown of hemoglobin. Accordingly, the pre-hepatic form can be caused by sickle cell anemia, malaria, and any other diseases that increase hemolysis rates. It also exists in a hepatic form, when bilirubin is not properly excreted by the liver, and a post-hepatic form, when it is not properly drained. Sometimes occurring harmlessly in infants for the first one or two weeks after birth, name this disease whose name comes from the French for "yellow," a yellowing of the skin and eyes.

Answer: **Jaundice**

Bonus 18: Fine Arts (Music)

Name the Russian composers of the following operas.

A: The Queen of Spades

B: Prince Igor

C: The Love for Three Oranges

D: The Tale of Tsar Saltan

Answers: A: **Pyotr Ilyich Tchaikovsky** B: **Alexander Borodin** C: **Sergei Prokofiev** D: **Nikolai Rimsky-Korsakov**

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

The volume of a cube is 3375 cubic inches, and you want to know the lateral surface area of the cube. Keeping in mind that the lateral surface area is only concerned with the sides around the cube and not the top and the bottom, and that 3375 is between 10 cubed and 20 cubed, find the lateral surface area of this cube.

Answer: **900 square inches**

Bonus 19: Literature (Literature)

Given the plot, identify the novel:

A: A son of Cedric the Saxon woos and wins the gentle Rowena in spite of his father's wishes to the contrary.

B: A teenage boy runs away from his prep school and spends two wryly humorous and adventuresome days in New York.

C: Napoleon invades Russia and disrupts the lives of the more than 500 characters who are skillfully drawn in this novel.

D: A bombardier during World War II tries to survive the war by pretending insanity. He encounters, in his compatriots, the worst traits of human nature.

Answers: A: Ivanhoe B: Catcher in the Rye C: War and Peace D: Catch-22

Tossup 20: Social Studies (Geography)

Recently, the definite article in its name has increasingly been dropped from common usage. It has been plagued by internal conflict within its western region, and stemming from this problem is more conflict with its western neighbor. This country's capital is located at the point where the Blue Nile, flowing west from Ethiopia meets the White Nile, flowing north from Uganda. Name this tenth largest country in the world, bordered on the west by Chad, home to the Darfur region and which has its capital at Khartoum.

Answer: **Republic of the Sudan**

Bonus 20: Math (Algebra)

Identify the following about the equation $5x^2 + 10 = 4y^2$. Express all answers with decimals rather than fractions, and with fully simplified radicals.

A: What conic section does it describe?

B: What is the length of its major axis?

C: What is the length of its minor axis?

D: What is its eccentricity?

Answers: A: Hyperbola B: $2\sqrt{2}$ C: $2\sqrt{2.5}$ D: $\sqrt{2.5}$

TIEBREAKERS/REPLACEMENTS:**Tossup 21: Science (Chemistry)**

The thallium variety is often used in thermometers because its freezing point is lower than that of pure mercury. Though iron cannot form one, most other metals can. Because silver and gold can readily form them, they have been used in mining. The type with copper is still commonly used in dental fillings. Name this term that refers to any alloy of mercury.

Answer: **Amalgam**

Bonus 21: Literature (Literature)

Answer the following questions about the novel *The Great Gatsby*.

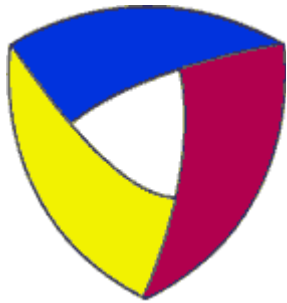
A: Which character narrates the story? Give first and last name.

B: In what decade does the novel take place?

C: That decade has a number of nicknames. Which one is often used in conjunction with this novel, a term that Fitzgerald also used in the title of a collection of his short stories?

D: What was Gatsby's original name? Give first and last name.

Answers: A: Nick Carraway B: 1920s C: The Jazz Age D: James Gatz



Aegis Questions

**District 207 Championship 2007
Varsity Round 3**

Tossup 1: Literature (Literature)

Give the full name. Thanks to reincarnation, he has killed Agrijag hundreds of times. Also, he learned to fly by heeding the words "Aim for the ground and miss." These are spectacular achievements by an exceedingly unspectacular individual, who just fell into incredible circumstances. He was introduced to the President of the Galaxy thanks to the Improbability Drive of the Heart of Gold and his friendship with Ford Prefect. What man, who had his house bulldozed by bureaucrats, was the protagonist of the Hitchhiker's Guide to the Galaxy series?

Answer: **Arthur Dent**

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

Identify these facts related to General John Pershing.

A: Pershing went by this nickname, which is also the name of a card game.

B: Pershing was in charge of this army unit during World War I.

C: Pershing led a failed search in Mexico for this man during the Mexican Revolution.

D: From 1906-1913, Pershing was a Brigadier General in this Pacific location.

Answers: A: **Black Jack** B: **American Expeditionary Force** (accept AEF) C: **Pancho Villa** (VEE-yuh; accept *Doroteo Arango Arámula* or *Francisco Villa*) D: **Phillipines**

Tossup 2: Science (Chemistry)

It uses a platinum and rhodium catalyst, and needs to be performed at over 4 atmospheres and 700 degrees Celsius. First patented in 1838 by Kuhlmann, it only gained significance after it was patented by its namesake in 1902, because another process was about to be invented that cheaply provided the raw materials for this process. Name this chemical process that converts ammonia into nitric acid.

Answer: **Ostwald process** (not the Haber process)

Bonus 2: Math (Algebra)

Algebraic groups need to satisfy all of these properties.

A: This property states that A times the quantity B times C, is the same as the quantity A times B, close quantity, times C.

B: This property states that the product of any two numbers in the group is also in the group.

C: There must be a number E, called this, such that A times E equals E times A, equals A.

D: Each number needs to have X, one of these, so that X times A equals A times X, equals E, the answer to the previous part.

Answers: A: **Associative multiplication** B: **Multiplicative closure** C: **Multiplicative identity element** (accept *neutral element*) D: **Multiplicative inverse element**

Tossup 3: Social Studies (U.S. History)

The real names of the men involved with this scandal were Jean Hottinguer (*Hawt-in-gare*), Pierre Bellamy, and Lucien Hauteval (*Loo-see-en Haw-tay-voll*). Those three men met with Elbridge Garry, Charles Pinckney, and John Marshall, requesting large sums of money and an apology from President John Adams in exchange for cooperating with the American diplomats. These events comprised what late 18th century scandal, in which the lackeys of French foreign minister Talleyrand demanded \$250,000 for a meeting with him?

Answer: **XYZ Affair** (accept *reasonable alternatives that include "XYZ"*)

Bonus 3: Miscellaneous (Interdisciplinary)

Answer these questions about the first Nobel Prizes.

A: The first winner of the Nobel Prize in Physics was this man, for the discovery of x-rays.

B: The first Nobel Peace Prize was awarded to two men, including this founder of the Red Cross.

C: The first Nobel Prize in Chemistry was awarded to this Dutch chemist, quote, "for his discovery of the laws of chemical dynamics and osmotic pressure in solutions."

D: Those and the other first Nobel Prizes were awarded in this year, five years after Alfred Nobel's death.

Answers: A: **Wilhelm Roentgen** B: **Jean Henri Dunant** C: **Jacobus Henricus van 't Hoff** D: **1901**

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

You want to find the cubed root of 50,653. Because its ones digit is three, you know there is only one possibility for the ones digit of the cubed root. In addition, because 50 cubed is 125,000, you know that the answer is substantially less than 50. With this information, find the cubed root of 50,653.

Answer: **37**

Bonus 4: Science (Biology)

Answer these questions about DNA replication.

A: The two ends of a DNA fragment are typically referred to by the numbers of the carbon atoms on this five-carbon sugar, the namesake of DNA.

B: DNA replication can only proceed in one direction. Using that nomenclature, it starts from the five-prime end, and replicates toward this end.

C: Because the two strands are oriented in opposite directions, the lagging strand is duplicated as these short fragments of DNA named after a Japanese scientist.

D: In the process of transcription, some DNA is copied onto RNA, in which this namesake sugar can be found instead.

Answers: A: **Deoxyribose** (*do not accept other endings*) B: **3-prime end** C: **Okazaki fragment** D: **Ribose** (*do not accept other endings*)

Tossup 5: Fine Arts (Visual Art)

The titular location is located in the Seine (*SENN*) between La Defense and the suburb of Neuilly.

The titular time is actually many times, since the artist completed about sixty studies for the huge work. The painting is 81 by 120 inches, and it took the artist two years to complete. Identify this work which has in its foreground two dogs, a monkey, a man with a pipe and a woman with an umbrella, and which was painted by Georges Seurat.

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

Bonus 5: Literature (Literature)

Identify the authors of these books with "colorful" titles:

A: White Fang

B: A Clockwork Orange

C: The Red and the Black

D: Chrome Yellow

Answers: A: **Jack London** B: **Anthony Burgess** C: **Stendhal** (*Accept Marie-Henri Beyle*) D: **Aldous Huxley**

Tossup 6: Literature (Mythology)

Bhaumasura (*BOW-ma-SOO-ra*) captured 16,000 wives for him, though his favorite woman was Radha, a gopi (*go-pee*). He spared the life of Kaliya, and to prevent a flood, lifted up a mountain with a single finger. Putana, Bakasura, and Aghasura were sent to kill him by Kamsa, but all failed. Name this Indian deity, the eighth avatar of Vishnu.

Answer: Krishna

Bonus 6: Math (Other)

In set theory, certain letters are used to represent very common groups, for example, capital N represents the natural numbers. Name the sets represented by the following letters.

A: Capital R

B: Capital C

C: Capital Z

D: Capital Q

Answers: A: Real numbers B: Complex numbers (*do not accept imaginary*) C: Integers D: Rational numbers

Tossup 7: Math (Other)

Treating the two inputs as column matrices, it is equivalent to the transpose of the first times the second. When divided by the product of the two magnitudes, it is equal to the cosine of the angle between the two vectors. Also known as the "inner product," it takes two vectors and returns a scalar, unlike a similarly-named operation that returns another vector. Name this binary product operation that equals zero when performed on two perpendicular vectors.

Answer: Dot product

Bonus 7: Social Studies (Current Events)

Identify these 2008 Presidential candidates.

A: This Illinois senator recently formed an exploratory committee.

B: If he were to win the election, this New Mexico governor would be the first Latino to win.

C: This Delaware senator was one of the first to announce his candidacy.

D: This former general, who ran in the 2004 Presidential race, has not yet declared his candidacy, though he is expected to.

Answers: A: Barack Hussein Obama, Jr. B: William "Bill" Blaine Richardson Lopez (*prompt on Lopez*) C: Joseph "Joe" Robinette Biden, Jr. D: Wesley "Wes" Kanne Clark

Tossup 8: Miscellaneous (Technology)

The newest version supports features like PNG (*ping*) transparency, RSS and Atom feeds, protected mode, anti-phishing (*ishing*) features, optional ActiveX controls, better standards support, and tabs. In 1998 it was subject to lawsuits because of its integration with its operating system. Though it reached a market share of over 95% in 2002, it now only has about 85%, thanks to its new competitor, Mozilla Firefox. Name this Microsoft web browser whose version 7 was released in October 2006.

Answer: Microsoft Internet Explorer (*accept IE, MSIE*)

Bonus 8: Fine Arts (Music)

Identify the nickname of each of the following Haydn symphonies.

A: Number 94 is named after the unexpected loud crash in the middle of the piece, though it really isn't all that astonishing.

B: Haydn wrote Number 45 to persuade his patron to allow the orchestra to take a vacation. At the end of this work, all the orchestra members leave in pairs, and at the end, only the first violinists are left.

C: Number 101 is named after a ticking rhythm in its second movement.

D: His last symphony, Number 104, is called by this nickname which is sometimes given to all of his twelve last symphonies, for the city in which he composed them.

Answers: A: **Surprise Symphony** B: **Farewell Symphony** C: **Clock Symphony** D: **London Symphony**

Tossup 9: Social Studies (World History)

In this man's youth, he once ran away with a friend, only to be caught by his father, the king. Also during his youth he corresponded with Voltaire, which makes sense considering he was an enlightened monarch. He got into many wars during his reign, including the War of Austrian Succession, in which he got Silesia. Name this Prussian ruler, the son of Frederick William I.

Answer: **Frederick the Great** (*prompt on Frederick; accept Frederick II*)

Bonus 9: Science (Physics)

Identify these fundamental forces of the universe.

A: By far the weakest force, at sea level it exerts a force of 9.8 Newtons for each kilogram of mass.

B: This force was unified by Maxwell's four equations governing both aspects of it. Its force carrier is the photon.

C: This force, sometimes combined with the previous one, changes the flavor of quarks, as in beta decay. It is governed by the W and Z bosons, and gets its name from the fact that it is many times less powerful than another force.

D: Described by quantum chromodynamics, it is mediated by gluons. Its name suggests it is the most powerful force.

Answers: A: **Gravity** B: **Electromagnetic** (*do not accept electroweak*) C: **Weak nuclear force** (*do not accept electroweak*) D: **Strong nuclear force**

Tossup 10: Science (Biology)

Discovered by Stanley Prusiner, they are resistant to breakdown by proteases, and even survive high-temperature sterilization. Though it is unclear how they function, they have a mutation that changes their shape and allows them to convert un-mutated molecules into their shape as well. Name these infectious proteins responsible for scrapies and mad cow disease.

Answer: **Prion** (*accept proteinaceous infectious agents*)

Bonus 10: Literature (Literature)

Illinois has been home to a number of celebrated writers, past and present. Given the name of a work, identify its Illinois author.

A: We Real Cool

B: The Adventures of Augie March

C: The House on Mango Street

D: Death in the Afternoon

Answers: A: **Gwendolyn Brooks** B: **Saul Bellow** C: **Sandra Cisneros** D: **Ernest Hemingway**

HALFTIME

Tossup 11: Math (Geometry) -- Computational (30 Seconds)

A right triangle's hypotenuse is divided into two segments of length 6 by the triangle's altitude to the hypotenuse, a line perpendicular to the hypotenuse that passes through the alternate vertex. You want to find the area of the entire triangle, which you realize must be isosceles. You can easily set up a system to solve for the leg and altitude, recognizing that two times the square of the leg must equal twelve squared, and that six squared plus the altitude squared equals the leg squared. Using this or any other method, what is the area of the entire triangle?

Answer: 36

Bonus 11: Science (Chemistry)

Name the following polyatomic ions.

A: C₂O₄

B: PO₃

C: N₃

D: ClO₄

Answers: A: Oxalate B: Phosphite (*do not accept phosphate*) C: Azide D: Perchlorate

Tossup 12: Social Studies (U.S. History)

Robert Ross's victory at the Battle of Bladensburg allowed his armies to proceed to this city. The city, only a minor port of about 8,000 people, was largely evacuated, so Ross's advance army encountered little resistance as they proceeded through the town. A tornado struck the city during the 26 hour occupation, and the British invaders were then dispatched to their next mission. Name this city, whose burning rallied thousands to defend Baltimore three weeks later.

Answer: Washington, D.C. (*accept partial answers*)

Bonus 12: Literature (Language Arts)

State what the following people collect:

A: A numismatist

B: A lepidopterist

C: A philatelist

D: A deltiologist

Answers: A: Coins B: Butterflies or Moths C: Postal stamps D: Postcards

Tossup 13: Science (Physics) -- Computational (30 Seconds)

A 10-Newton mass is swung around on a two-meter string in a horizontal circle. If it is traveling with a linear speed of three meters per second, what is the tension on the string, in Newtons?

Answer: 45 Newtons

Bonus 13: Fine Arts (Visual Art)

Identify the following works of art.

A: One of the timepieces has a fly on it, while another is being devoured by ants. In the center of the painting is a distorted human face in profile.

B: This painting depicts the daughter of King Philip IV of Spain and her ladies-in-waiting, along with her mastiff and a dwarf.

C: The fighters are from a variety of classes, including a man in a top hat, and a boy brandishing two pistols. The central figure is a barefooted woman carrying a bayoneted musket in one hand and raising a flag in the other.

D: Its proper name is 'The Company of Frans Banning Cocq and Willem van Ruytenburch'.

Answers: A: The Persistence of Memory B: Las Meninas (*accept The Maids of Honor*) C: Liberty Leading the People (*accept La Liberté guidant le peuple*) D: The Night Watch

Tossup 14: Literature (Literature)

Chapters 1 through 44 deal with the title character, and chapters 45 to 53, the so-called Uji chapters, are about his descendants. Chapter 54, titled "The Floating Bridge of Dreams," ends in mid-sentence and might not be complete. Name this Japanese epic attributed to an unknown author called Murasaki Shikibu.

Answer: **The Tale of Genji** (*accept Genji Monogatari*)

Bonus 14: Social Studies (World History)

Given a description, name the ancient American civilization.

A: This group that dominated south-central Mexico lived from about 1200 BC to 400 BC.

B: This group built their namesake "lines" in Peru, and lasted from about 300 BC to 800 AD.

C: With their capital at Cuzco (*COOS-co*), this group dominated Peru and beyond for over 300 years.

D: For nearly 300 years this group ruled over what is now Mexico. Their capital was at Tenochtitlan (*tay-NOAK-teet-lan*)

Answers: A: **Olmec** B: **Nazca** C: **Inca Empire** (*accept Incan*) D: **Aztec Empire** (*accept Aztecs*)

Tossup 15: Miscellaneous (Other)

On February 22, 2006, 16-year-old Alex Ostrovsky of West Bloomfield, Michigan, was catapulted to fame using this. Among the file formats the software can read are MP3, WAV (*wave*), AAC, and even Windows Media format. Available for Mac OS X, as well as Windows 2000 and up, it is currently at Version 6.0.3. For ten points, Speed of Sound by Coldplay was the billionth song sold on what music store run by Apple Computers?

Answer: **iTunes Music Store** (*prompt on iPod*)

Bonus 15: Math (General)

Given the eccentricity of a conic section, name the type of conic section it is.

A: 5

B: 1

C: 0.2

D: 3

Answers: A: **Hyperbola** B: **Parabola** C: **Ellipse** D: **Hyperbola**

Tossup 16: Science (Chemistry)

Discovered in 1905 by Albert Einhorn, it has a half-life in the body of about one minute. A sizable percentage of the population experiences adverse effects because they are unable to correctly metabolize it. Along with its short duration and the later discovery of better local anesthetics, it is not commonly used today, though to most people, its name remains synonymous with visits to a particular type of doctor. Name this drug commonly associated with dental anesthesia, whose name comes from the fact that it is a "newer" replacement for cocaine.

Answer: **Novocain** (*accept procaine*)

Bonus 16: Literature (Literature)

Given a literary location, name the author in whose work you would find the location.

A: Cross Creek, Florida

B: Yoknapatawpha County

C: Devon School

D: Lowood School

Answers: A: **Marjorie Kinnan Rawlings** B: **William Faulkner** C: **John Knowles** D: **Charlotte Bronte**

Tossup 17: Social Studies (Other)

Also known as the "lex parsimoniae" or law of succinctness, it has been parodied many times, as by Crabtree's bludgeon, the humorous principle that the human mind can always come up with an explanation complicated enough to explain any set of inconsistent observations. Name this sharp principle named a 14th-century English friar, which states that the simplest explanation for something is usually the best.

Answer: **Occam's razor**

Bonus 17: Miscellaneous (Technology)

Given the file suffix of a computer program, name the programming language it must have been written in. (*spell out*)

A: BAS

B: PL

C: PY

D: JAR

Answers: A: **BASIC** (*accept more specific answers*) B: **Perl** C: **Python** D: **Java**

Tossup 18: Fine Arts (Music)

Originally growing out of the Italian overture form, these only began to take on their current form in the eighteenth century, when they were arranged in a fast-slow-fast fashion. A fourth section was later added, and this form soon established itself as a mainstay of the classical period. Name this musical form that often consists of four movements played by an orchestra, and whose most famous examples include the 106 of Haydn, 41 of Mozart, and nine of Beethoven.

Answer: **Symphony**

Bonus 18: Science (Biology)

Answer these questions about the hormone-producing cells of the pancreas.

A: The endocrine cells of the pancreas are located in thousand-cell clusters called these, because they resemble islands.

B: Named after a Greek letter, this best-known and most common type of endocrine cell produces insulin.

C: Also named after a Greek letter, this type of endocrine cells produces glucagon.

D: Yes, also named after a Greek letter, this least common type of endocrine cell produces somatostatin.

Answers: A: **Islets of Langerhans** B: **Beta cell** C: **Alpha cell** D: **Delta cell**

Tossup 19: Literature (Literature)

This poem's author wanted the title entity to have the old english spelling so that it would evoke more emotion. The title character of the poem is thought to represent the Industrial Revolution in England, which is reinforced by the lines "What the hammer? what the chain? In what furnace was thy brain?" Written in 1794, it is commonly compared to one of the author's earlier poems, The Lamb, which portrayed an idyllic pastoral scene. Name this poem that is contained within the collection 'Songs of Experience', by William Blake and is about an animal that is "Burning bright, In the forests of the night."

Answer: **The Tyger**

Bonus 19: Math (Calculus)

Evaluate the following limits.

A: The limit, as x approaches 2, of the quantity x plus 2, close quantity, divided by the quantity x minus 2.

B: The limit, as x approaches one, of the quantity $3x$ squared minus 2 divided by the quantity x plus 1.

C: The limit, as x approaches infinity, of 3 plus $4x$ to the fifth power divided by $3x$ to the fifth power.

D: The limit, as x approaches negative two, of the quantity x squared minus 4, close quantity, divided by the quantity x plus two.

Answers: A: **The limit does not exist** (*do not accept zero or infinity*) B: **1/2 or 0.5** C: **4/3** D: **-4**

Tossup 20: Math (Algebra) -- Computational (30 Seconds)

You have the quadratic, x squared plus three x minus ten. You want to find another quadratic with leading coefficient of one, whose roots are the reciprocals of the roots in the original quadratic. While you can do this by explicitly finding the original roots and then creating a new quadratic, it may be faster to use a trick with the polynomial's coefficients, remembering to divide by ten afterwards. Either way, find a quadratic whose roots are the reciprocals of the roots of x squared plus three x minus ten.

Answer: **$x^2 - .3x - .1$** (*or $x^2 - 3/10 x - 1/10$*)

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

Given a description, name the member of the Continental Congress.

A: This man nearly missed the voting for the Declaration of Independence. He is pictured riding a horse on the Delaware state quarter.

B: This Connecticut politician became the Mayor of New Haven in 1784.

C: This Virginian delegate served as Secretary of State under Jefferson, and then succeeded him as president.

D: This man, one of the authors of the Federalist Papers, was the first Secretary of the Treasury. You might recognize him, as he is pictured on the ten dollar bill.

Answers: A: **Caesar Rodney** B: **Roger Sherman** C: **James Madison** D: **Alexander Hamilton**

TIEBREAKERS/REPLACEMENTS:**Tossup 21: Literature (Literature)**

He was a gambler, like Alexai. He was epileptic, like Pavel Smerdyakov. He was not an idiot like Myshkin, but an intellectual, though not as rebellious and neurotic as Raskolnikov or the Underground Man. His work explored not only the struggles of nineteenth century Russian life, but also the quest for God and the problem of evil. Identify the author of "The Gambler," "The Idiot," and "Crime and Punishment."

Answer: **Fyodor Dostoevsky**

Bonus 21: Math (Geometry)

Find the area of the following triangles.

A: An equilateral triangle with side length 6.

B: An isosceles triangle with base 4 and other sides 5.

C: A triangle with sides 5, 9, and 10.

D: A triangle on the Cartesian plane with vertices at (1, 2), (3, 4), and (7, 9).

Answers: A: **9 root 3** B: **2 root 21** C: **6 root 14** D: **1**



Aegis Questions

**District 207 Championship 2007
Frosh-Soph Round 1**

Tossup 1: Literature (Mythology)

He revealed his true glory to Semele, who, as a result, was burned to a crisp. He then kept her unborn baby, which was his son, in his thigh until it was born. This is not the only strange childbearing moment in which he partook. One of his mistresses lay eggs out of which came Helen of Troy— among others, and another gave birth out of his head after he ate her. Identify this father of Perseus, Dionysus, and Athena.

Answer: **Zeus** (accept *Jupiter*)

Bonus 1: Fine Arts (Music)

Identify the following musical works that have something in common.

A: The finale of this fourteen-movement suite by Camille Saint-Saëns was featured in Fantasia 2000.

B: This 1936 composition by Sergei Prokofiev tells a children's story with a narrator and orchestra, representing the titular boy with a string theme.

C: This ballet by Pyotr Ilyich Tchaikovsky features Prince Siegfried and his attempt to marry the charmed Odette.

D: This opera by Puccini is about a Japanese geisha girl who marries an American naval lieutenant, only to kill herself after he leaves her.

Answers: A: **Carnival of the Animals** B: **Peter and the Wolf** C: **Swan Lake** D: **Madama Butterfly**

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

Consider the set 5, 10, 15, 20, and so on, up to and including the number 60. Find the mean of this set. Finding the mean normally requires knowing the sum of the set as well as how many numbers are in the set. However, you only need to know the latter, if you realize that the terms of this series are equally spaced apart, so you can simply consider the average between the two middle terms. Using these or any other method, find the mean of the set.

Answer: **65/2** (accept *32.5* or *32 and one-half*)

Bonus 2: Science (Chemistry)

Give the chemical formula for each of the following acids.

A: Nitric acid

B: Nitrous acid

C: Hydrobromic acid

D: Ethanoic acid

Answers: A: **HNO₃** B: **HNO₂** C: **HBr** D: **CH₃COOH** (accept *C₂H₄O₂*)

Tossup 3: Social Studies (U.S. History)

The only man to be TIME magazine's Man of the Year three times, he was born in New York in 1882 and married his fifth cousin in 1905. Contrary to popular belief, scientists now think he actually contracted Guillain-Barré (*ghee-AHN bar-AY*) syndrome on his 1921 vacation causing his subsequent paralysis. Despite his illness, he went on to become Governor of New York from 1928 to 1932. Name this man who then became President of the United States until his death in 1945.

Answer: **Franklin Delano Roosevelt**

Bonus 3: Literature (Literature)

Given the title of an American play, identify its author.

A: Cat on a Hot Tin Roof

B: The Crucible

C: Anna Christie

D: The Skin of our Teeth

Answers: A: **T. S. Eliot** B: **Arthur Miller** C: **Eugene O'Neill** D: **Thornton Wilder**

Tossup 4: Fine Arts (Visual Art)

The artist painted his unrequited lady love staring, like himself, straight out at the viewer, as if enabling them to be together forever. He also added a portrait of Michelangelo later, after being moved by his work in the Sistine Chapel. Name this fresco, which also includes portraits of Aristotle and Plato, by Raphael.

Answer: **The School of Athens**

Bonus 4: Miscellaneous (Sports)

A well known television program moved from ABC to ESPN this year, and in its ESPN premiere, broadcasted a doubleheader.

A: Name that program, which has been hosted by, among others, Howard Cosell, Al Michaels, and Dennis Miller.

B: This broadcaster joined the program in 2006, having previously worked on ESPN shows such as The Sports Reporters and Pardon the Interruption.

C: This team won the first game of the doubleheader over the Washington Redskins on a last minute field goal by Ryan Longwell.

D: This team shut out the Oakland Raiders 27-0 in the second game, which included an Antonio Gates touchdown reception.

Answers: A: **Monday Night Football** B: **Tony Kornheiser** C: **Minnesota Vikings** (accept either or both) D: **San Diego Chargers** (accept either or both)

Tossup 5: Science (Biology)

This, despite having never actually lived, is one of the most widely recognizable names when people talk about dinosaurs. As recently as 1989, the US Post Office issued four dinosaur stamps, Tyrannosaurus, Stegosaurus, Pteradon and this dinosaur that was created by putting the skull and jaw of a Camarasaurus on the body of an Apatosaurus.

Answer: **Brontosaurus**

Bonus 5: Math (Geometry)

Given a cube with side length four inches, find the following measurements. Be sure to include units in your answer.

A: What is the volume?

B: What is the surface area?

C: What is the lateral surface area?

D: What is the length of the great diagonal of the cube?

Answers: A: **64 cubic inches** B: **96 square inches** C: **64 square inches** D: **$4\sqrt{3}$ inches**

Tossup 6: Literature (Literature)

Based on the true case of Chester Gillette and Grace Brown, it tells of a young man who, smitten with the elegant Sondra, allows his pregnant girlfriend Roberta to drown in a New York lake. Name this novel, which deals with the sensational trial of Clyde Griffiths, by Theodore Dreiser.

Answer: **An American Tragedy**

Bonus 6: Science (Physics)

Answer these questions about the definitions of the SI base units.

A: The meter is defined in terms of this quantity, making it now an exact number.

B: This base unit is defined in terms of a platinum-iridium cylinder in France.

C: The second is defined in terms of radiation oscillations of the 133 isotope of this atom.

D: The mole is defined in terms of the number of atoms in a certain mass of this element.

Answers: A: **Speed of light** B: **Kilogram** (do not accept gram, as it is not an SI base unit) C:

Cesium D: **Carbon(-12)**

Tossup 7: Miscellaneous (Entertainment)

It is rumored that this band chose its name because when testing out different names, it's what attracted the largest crowd. One of their most famous songs contains lyrics that prompt the crowd to throw Kraft Food products on the stage, and some of their first big hits were Shoebox and Brian Wilson. Name this Canadian band that recently has gotten airplay for Easy, but whose most famous songs are still One Week and If I Had a Million Dollars.

Answer: **Barenaked Ladies**

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

Given a description, name the U.S. president.

A: The only unmarried President

B: Only President to hold a patent

C: Only President to serve as a Chief Justice

D: Only President to be elected to four terms in office

Answers: A: **James Buchanan** B: **Abraham Lincoln** C: **William Howard Taft** D: **Franklin Delano Roosevelt** (*Prompt on Roosevelt; Accept FDR*)

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

Two answers required. Solve the following radical equation. The square root of the quantity x squared plus one, close quantities, equals eleven.

Answer: **Plus or minus 2√30**

Bonus 8: Literature (Language Arts)

Spell the following historical final words from the Scripps National Spelling Bee.

A: Kamikaze (*KAH-mih-KAH-zee*)

B: Antediluvian (*AN-tee-dil-OO-vee-un*)

C: Promiscuous (*pruh-MIS-kyoo-us*)

D: Torsion (*TORE-shun*)

Answers: A: **KAMIKAZE** B: **ANTEDILUVIAN** C: **PROMISCUOUS** D: **TORSION**

Tossup 9: Science (Chemistry)

With an electronegativity of 3, its five valence electrons make it typically trivalent (*try-VAY-lent*).

Present in all living things, and excreted by humans as urea, name this chemical element that makes up 78% of the earth's atmosphere, as well as many important compounds like ammonia, the element with atomic number 7.

Answer: **Nitrogen**

Bonus 9: Social Studies (Geography)

Name the straits of water that separate the following.

A: Mediterranean Sea and Atlantic Ocean

B: United States and Russia

C: English Channel and North Sea

D: Tierra del Fuego and South America

Answers: A: **Strait of Gibraltar** B: **Bering Strait** C: **Strait of Dover** D: **Strait of Magellan**

Tossup 10: Social Studies (World History)

In 1987 it was made a UNESCO World Heritage Site. A charity run alongside it reported that it was clearly discernible and only moderately eroded along 22% of the run; usually discernible but frequently broken or eroded 41% of the run, and scarcely discernible and almost totally eroded 37% of the run. Its visibility from space is a highly contested fact. Identify this structure that was not constructed as a single endeavor, but was built over nearly two millenia and was overseen by many different dynasties.

Answer: Great Wall of China

Bonus 10: Math (Other)

You are rolling one fair six sided die, and want to know how to find the probability of rolling an even number 2 times out of 6. Answer the following questions that show, step by step, how to do this problem with the binomial theorem.

A: Find the first term, which accounts for different arrangements of the correct answer. This term is found by finding n choose r , where n is the total number of events and r is the number of desired events.

B: Find the second term, the probability that the desired event occurs once, raised to the n th power, where n is the number of times that event needs to occur.

C: Find the third term, the probability that the desired event does not occur once, raised to the n th power, where n is the number of times the event needs to not occur.

D: Now, for the last five points, find the total probability, by multiplying the previous three answers.

Answers: A: 15 B: 1/4 (.25) C: 1/16 (.0625) D: 15/64

HALFTIME

Tossup 11: Fine Arts (Music)

He was born to a musician, and had only one surviving sibling, a sister nicknamed Nannerl (*NAN-er-ul*). A prolific composer, he wrote over twenty operas, and 626 works in total, according to the Kochel (*KER-shul*) catalog. A member of the same Masonic Lodge as his contemporary, Haydn, Masonic thinking heavily influenced his final opera, *The Magic Flute*. Name this classical composer who wrote 41 symphonies, and whose last work was a Requiem.

Answer: **Wolfgang Amadeus Mozart**

Bonus 11: Science (Earth Science)

Locate the following minerals on the Mohs scale of hardness.

A: Diamond

B: Gypsum

C: Talc

D: Apatite

Answers: A: 10 B: 2 C: 1 D: 5

Tossup 12: Math (Geometry)

The pyramid on the back of the one-dollar bill can be considered one of these, as the capstone has been removed from the rest of the pyramid. One formula for the volume of these objects includes the harmonic mean of the areas of the bases, although the more common formula simply involves subtracting the missing volume from the original total. What is this geometric figure that is formed by two parallel planes cutting through the solid?

Answer: **Frustum** (*grudgingly accept frustrum*)

Bonus 12: Social Studies (World History)

Name these things about Napoleon.

A: He was born on what French island?

B: When he was exiled the first time, Napoleon was sent to what island?

C: When he was exiled for the second time, Napoleon was sent to what island?

D: During what year did Napoleon launch a failed attack on Russia, that was doomed by the cold winter?

Answers: A: **Corsica** B: **Elba** C: **St. Helena** D: **1812**

Tossup 13: Miscellaneous (Other)

This company's logo has been said to feature potential subliminal advertising via an arrow formed by the white space between the last two letters of the name. Founded by Fred Smith in 1971, it began transporting cargo via jet airliners in 1973 and changed its name to the common five letter abbreviation in 2000. Name this company that bought Kinko's in 2004 and was featured in the 2000 Tom Hanks film, *Cast Away*.

Answer: **FedEx** or **Federal Express**

Bonus 13: Literature (Literature) -- Five Parts

Identify the authors of the following "tales".

A: The Canterbury Tales

B: The Handmaid's Tale

C: The Winter's Tale

D: Twice-Told Tales

E: Tales of the South Pacific

Answers: A: **Geoffrey Chaucer** B: **Margaret Atwood** C: **William Shakespeare** D: **Nathaniel Hawthorne** E: **James A. Michener**

Tossup 14: Social Studies (Geography)

It's located in the Khumbu Himal (*KOOM-boo HIM-ull*) range, and the easiest way to get there is to take the South Col pass through Nepal. Its summit was first reached in 1953 by Tenzing Norgay and Edmund Hillary. Name this mountain, which, at over 29,000 feet above sea level, is the tallest in the world.

Answer: **Mount Everest**

Bonus 14: Fine Arts (Visual Art)

Answer these questions about Pablo Picasso.

A: Pablo Picasso is best known for helping create this style of painting with Georges Braque, where objects are broken up into different facets so that they can be viewed from multiple angles at once.

B: From 1901 to 1904, Picasso underwent this colorfully-named period in which many of his paintings, like *The Old Guitarist*, had this somber tint.

C: From 1905 to 1907, Picasso underwent this colorful period with more upbeat colors, like orange and the period's namesake color.

D: This famous huge 1937 painting by Picasso illustrates the horrors of war, dramatizing the Nazi bombing of the title Basque town.

Answers: A: **Cubism** B: **Blue Period** C: **Rose Period** D: **Guernica**

Tossup 15: Literature (Literature)

It is a frame story, beginning with the narrator, a stand-in for the author, is working in the Salem Custom-House. It begins and concludes with large public gatherings involving the three main characters on display. Reverend Dimmesdale is father to Pearl through an adulterous relationship with Hester Prynne in what work by Nathaniel Hawthorne?

Answer: **The Scarlet Letter**

Bonus 15: Math (General)

Consider the following set of numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, and 29.

A: What is the mean of the set?

B: What is the range of the set?

C: What is the median of the set?

D: What is the mode of the set?

Answers: A: **12.9** B: **27** C: **12** D: **No mode** (*do not accept zero*)

Tossup 16: Science (Physics)

It is measured in kilogram meters per second. A change in this quantity has the same units, though it is called "impulse." It is conserved in a closed system, even during collisions, whether elastic or inelastic. Name this quantity represented by the letter *p*, equal to mass times velocity.

Answer: **Momentum** (*accept linear momentum*)

Bonus 16: Literature (Literature)

Answer the following questions about the novel *The Catcher in the Rye*.

A: Name the main character. Give first and last name.

B: Name that character's younger brother who died in 1946.

C: Name the city used as the main setting.

D: Name the Scottish folk song that inspired the title

Answers: A: **Holden Caulfield** B: **Allie Caulfield** C: **New York, New York** D: **Comin' through the Rye**

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

Order factors from smallest to largest, and use powers to express repeated factors. What is the prime factorization of the number 216,216? It may help you to know that 1001 is the product of three consecutive prime numbers, and that there are five distinct integers in the prime factorization, not counting exponents.

Answer: **2 cubed times 3 cubed times 7 times 11 times 13**

Bonus 17: Science (Biology)

Identify these phases of mitosis, the process of cellular division.

A: In this first phase, the chromatin in the nucleus bundles into chromosomes, and the nuclear envelope disintegrates.

B: In this second phase, the chromosomes line up in the middle of the cell on a namesake plate.

C: In this third phase, the chromosomes go to opposite sides of the cell.

D: The final phase, it accompanies cytokinesis. In this phase, the cells pull apart, nuclear envelopes reform, and the chromosomes unwind.

Answers: A: **Prophase** B: **Metaphase** C: **Anaphase** D: **Telophase**

Tossup 18: Literature (Literature)

Its setting at first appears utopian but is revealed to be dystopian in its lack of emotional depth and diversity. The story follows the emotional journey of Jonas, who sees the flaws in his society after experiencing memories from previous times. Name this young-adult classic by Lois Lowry.

Answer: **The Giver**

Bonus 18: Miscellaneous (Entertainment)

World War II seems to be a popular setting for movies or miniseries. Identify these movies or miniseries set in World War II.

A: This 2001 film starring Josh Hartnett and Ben Affleck details the bombing and aftermath of the titular location.

B: Steven Spielberg directed this 1998 film that starred Tom Hanks as an Army Ranger Captain who was sent to bring home the titular character, played by Matt Damon.

C: This miniseries, based on a book written by Stephen E. Ambrose, follows the Easy Company, a member of the 101st Airborne Division, throughout Europe.

D: This 2000 film starred Matthew McConaughey as a navy submariner who leads a crew that takes over a German U-Boat for the purpose of capturing an Enigma machine.

Answers: A: **Pearl Harbor** B: **Saving Private Ryan** C: **Band of Brothers** D: **U-571**

Tossup 19: Social Studies (U.S. History)

At seventy-six years old, she labored in battlefields during the 1898 Spanish American War. Directing ambulance wagons, the "Angel of the Battlefield" of the American Civil War guided her visionary of the American Red Cross.

Answer: **Clara Barton**

Bonus 19: Math (General)

Convert the following angle measures to radians.

A: 0.25 degrees

B: 48 degrees

C: 10800 degrees

D: 75 gradians

Answers: A: **Pi over 720 radians** B: **4 pi over 15 radians** C: **60 pi radians** D: **3 pi over 8 radians**

Tossup 20: Science (Biology)

They have an unusual three-phase life cycle, which includes haploid, diploid, and dikaryotic (*DI-kair-ee-AH-tic*) phases. In the latter phase, the hyphae (*HI-fay*) contain nuclei from both parents, but the nuclei are not fused into diploid cells. Unlike plants, they are heterotrophs, and unlike animals, they have cell walls, though these are made of chitin (*KITE-in*) instead of cellulose. Name this kingdom of organisms that include unicellular yeasts and multicellular mushrooms.

Answer: **Fungi**

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

Identify these historic Supreme Court cases dealing with racial issues.

A: This 1857 Supreme Court case stated that a slave was property, and wasn't considered free because he was on free land.

B: This 1896 Supreme Court case about segregated boxcars established the doctrine of "separate but equal" facilities.

C: This 1954 Supreme Court case overturned the previous case, saying that separate is inherently unequal, ordering the desegregation of public schools.

D: This 1978 Supreme Court case ruled in favor of a white man denied admission to medical school because of racial quotas.

Answers: A: **Dred Scott v. Sanford** B: **Plessy v. Ferguson** C: **Brown v. Board of Education of Topeka, Kansas** D: **Regents of the University of California v. Bakke**

TIEBREAKERS/REPLACEMENTS:**Tossup 21: Science (Physics)**

When referring to the planets, it is either nodal or apsidal. When referring to the equinoxes, it is a cycle that takes almost 26,000 years to complete. The gyroscopic kind, however, is induced by adding a torque. Name this phenomenon, the change of direction of the axis of a moving object, that causes spinning objects to wobble.

Answer: **Precession**

Bonus 21: Social Studies (Geography)

Given a country, name its largest city.

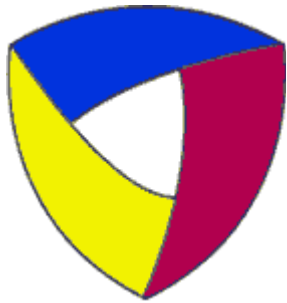
A: Brazil

B: India

C: Scotland

D: United Arab Emirates

Answers: A: **Sao Paulo** B: **Mumbai** C: **Glasgow** D: **Dubai**



Ægis Questions

**District 207 Championship 2007
Frosh-Soph Round 2**

Tossup 1: Math (General)

If their argument is not a multiple of pi over two, then they cannot be referred to except by this name. That's equivalent to saying that they don't lie on either axis of an Argand diagram, because both axes represent subsets with special names. Because they lie on a plane instead of a line, they do not have an ordering, though their magnitude can be determined by the square root of the sum of the squares of the coordinates. Name this plane of numbers which can be written in the form $a + bi$, a set of numbers which includes the real and imaginary numbers.

Answer: **Complex numbers** (do not accept real or imaginary numbers)

Bonus 1: Literature (Mythology) -- Five Parts

Given an art, identify the muse that was in charge of it.

A: Comedy

B: Dance

C: History

D: Astronomy

E: Sacred poetry

Answers: A: **Thalia** B: **Terpsichore** C: **Clio** D: **Urania** E: **Polyhymnia**

Tossup 2: Social Studies (U.S. History)

This man, whose birth name meant "Thunder Rolling Over the Mountains," grew up while his father had to deal with constant demands to give up his tribe's lands. In 1871 he took over as Chief, six years before his famous proclamation. Name this Nez Perce indian Chief, who "died of a broken heart" in 1904, and in 1877 promised to "fight no more forever."

Answer: **Chief Joseph** (accept *Hin-mah-too-yah-lat-kekt* and *Hinmaton-Yalaktit*)

Bonus 2: Miscellaneous (Sports)

Name the mascots of the following baseball teams.

A: Philadelphia Phillies. This green fuzzy creature with a long beak has been the mascot since 1978.

B: Montreal Expos. This orange giant was originally a Jim Henson creation. When the Expos moved to Washington, this mascot was adopted by the Montreal Canadiens.

C: New York Mets. This baseball-headed mascot was featured in a "This is Sportscenter" commercial, driving home with wife and sleeping child in tow.

D: Chicago Cubs. While he is not an official mascot, he considers himself the Troubadour of the Cubs. His skill basically consists of yelling "Woo! Cubs!" and the like.

Answers: A: **Philly Phanatic** B: **Youppi!** C: **Mr. Met** D: **Ronnie Woo Woo**

Tossup 3: Fine Arts (Visual Art)

The backdrop of this painting is said to symbolize the fallout from Krakatoa, which had erupted ten years previously in 1883, and caused spectacular sunsets in the following years. The central figure has no apparent hair, and its body seems to sway while it leans on the railing of the bridge. Name this work, the most famous by Edvard Munch (*MUNK*), which was recently recovered in Norway.

Answer: **The Scream** (accept *The Cry*)

Bonus 3: Math (Other)

Calculate the following combinations or permutations.

A: 9 P 4

B: 5 C 0

C: 10 C 3

D: 9 P 9

Answers: A: **3024** B: **1** (do not accept 0 or "does not exist") C: **120** D: **362880**

Tossup 4: Science (Chemistry)

This equation factors in "b," the volume of a mole of particles, and "a," a measure of attraction between particles, to describe the behavior of real fluids more accurately than the ideal gas law. It shares its name with a class of intermolecular forces. Name this gas equation or type of force, both named after a nineteenth-century Dutch chemist.

Answer: **Van der Waals equation/forces**

Bonus 4: Social Studies (Geography)

Identify these countries.

A: The Andes mountains pass through this country whose capital is Lima.

B: This country's capital is Wellington and it's made up of 2 main islands in the Pacific.

C: This country's capital is Brussels and official languages are Dutch and French

D: This country is located in northeastern Africa, and its capital is Addis Ababa. Its name means "burned faces."

Answers: A: **Peru** B: **New Zealand** C: **Belgium** D: **Ethiopia**

Tossup 5: Literature (Language Arts)

Though it is unclear who created it, it is derived from the Glagolitic alphabet of St. Methodius and St. Cyril. Used in many languages, its lowercase letters are mostly just smaller versions of the uppercase ones. Name this alphabet used in Mongolia, Bulgaria, Serbia, the Ukraine, and Russia.

Answer: **Cyrillic alphabet**

Bonus 5: Science (Chemistry)

Given the atomic symbol, name the element. Each element is named for a nationality.

A: Fr

B: In

C: Ge

D: Ga

Answers: A: **Francium** B: **Indium** C: **Germanium** D: **Gallium**

Tossup 6: Social Studies (Geography)

The Cascade mountain range runs from north to south through this state. Peaks of the Cascades in this state include Mount Baker, Mount Adams, and Mount Rainier, and the High Cascades are volcanic. The Columbia River forms most of its border with its neighbor to the south. Identify this state, the 42nd admitted to the Union, which shares a border with British Columbia and whose capital is Olympia.

Answer: **Washington**

Bonus 6: Literature (Literature)

Identify the authors of the following trilogies:

A: The Fellowship of the Ring, The Two Towers, and The Return of the King, known as The Lord of the Rings trilogy.

B: 1919, The 42nd Parallel, and The Big Money; known as the U.S.A. trilogy.

C: Out of the Silent Planet, Perelandra, and That Hideous Strength, known as the Perelandra trilogy.

D: Young Lonigan, The Young Manhood of Studs Lonigan, and Judgment Day, known as the Studs Lonigan trilogy.

Answers: A: **J(ohn) R(onald) R(ue)l Tolkien** B: **John Dos Passos** C: **C(live) S(taples) Lewis** D: **James T. Farrell**

Tossup 7: Math (Algebra) -- Computational (30 Seconds)

Y varies inversely as the square of x. If y equals 12 when x equals 3, what does y equal when x equals 6? Give your answer as a mixed number reduced to lowest terms.

Answer: 3

Bonus 7: Science (Biology)

Name these organelles.

A: The only organelle in prokaryotes, it helps translate mRNA into proteins.

B: Possibly derived from a small bacterium, this organelle creates most of the ATP available to the cell.

C: This organelle is a large membrane that is either rough or smooth, and creates many macromolecules.

D: This organelle is found in plants and other photosynthetic organisms, and contains chlorophyll.

Answers: A: Ribosome B: Mitochondrion C: Endoplasmic reticulum (accept ER) D: Chloroplast

Tossup 8: Miscellaneous (Entertainment)

Leo Gorcey is not present on it because he demanded payment. Mohandas Gandhi is not present because EMI feared that they would catch offense in India. Stephen Crane is present, but is obscured by Issy Bonn's hand, which waves over Paul McCartney's head. Adolf Hitler and Jesus Christ were rejected to appear on the cover of what 1967 album released by The Beatles?

Answer: The album cover of Sergeant Pepper's Lonely Hearts Club Band (prompt on Sergeant Pepper)

Bonus 8: Fine Arts (Music)

Given a description of the titular character or object in an opera, name the opera.

A: This Mozart opera is named after the musical instrument given to Tamino, who seeks to free Pamina from Sarastro.

B: This Strauss opera is named after Octavian, who bears a particular flower to Sophie von Faninal.

C: This Puccini opera is named after Cio-Cio-San, a young Japanese geisha girl.

D: This Mozart opera is named after an event in the palace of Count Almaviva, concerning his title valet.

Answers: A: The Magic Flute (accept *Die Zauberflöte*) B: Der Rosenkavalier (accept *The Knight of the Rose*) C: Madama Butterfly D: The Marriage of Figaro (accept *Le Nozze di Figaro*)

Tossup 9: Science (Biology)

P680 and P700 are responsive up to 680 and 700 nanometer wavelengths, respectively, though the "b" variety of P680 is most effective below 500 nanometers. The difference in absorbance spectra comes from their differing colors: "a" is green, but "b" is yellow-green. After absorbing light, they pass on excited electrons to their photosystems, which pass them to the electron transport chain. Name this molecule with a central magnesium atom, that absorbs light for plants to use in photosynthesis.

Answer: Chlorophyll

Bonus 9: Math (Algebra)

Find the sum of the vertical shift and period of the following periodic functions.

A: Y equals 2 sine of the quantity 4 pi x, close quantity.

B: Y equals -4 sine of the quantity 9 pi x plus 2 pi, close quantity, plus 3.

C: Y equals 3 tangent of the quantity pi x over 16, minus 1, close quantity, plus 2.

D: Y equals 3 cosine of the quantity 2 x minus 2, close quantity, plus 10.

Answers: A: 0.5 B: 3 and two-ninths (accept 29/9) C: 18 D: 10 plus pi

Tossup 10: Literature (Literature)

The first American to win the Nobel Prize, this writer was born in a small, Midwestern town, which provided the inspiration for Zenith, Winnemac and the line, "This is America - a town of a few thousand, in a region of wheat and corn and dairies and little groves. The town is, in our tale, called 'Gopher Prairie, Minnesota.' But its Main Street is the continuation of Main Streets everywhere." Identify this author of Arrowsmith, Main Street and Babbit.

Answer: **Sinclair Lewis**

Bonus 10: Social Studies (World History)

Let's see how much you know about 15th and 16th century Spain.

A: The monarchs Ferdinand and Isabella were from these respective territories. Both answers are required for credit.

B: Ferdinand and Isabella instigated this movement in Spain, which banished all Jews and Moors, among others, from the country.

C: This "invincible fleet" was defeated by the English in the late 1500s.

D: This king who sent out that fleet was married to England's Queen Mary.

Answers: A: **Aragon and Castille** (*F and I respectively; accept Arago and Castilla*) B: **Spanish Inquisition** (*accept Reconquista*) C: **Spanish Armada** (*accept Armada Catolica*) D: **Philip II of Spain** (*prompt on Philip*)

HALFTIME

Tossup 11: Fine Arts (Music)

It opens with the solemn announcement of declaration of war, followed by a hymn praying for success played by the strings. The battle theme is performed by horns, and the ensuing retreat is shown by a diminuendo. Following the battle, the hymn is reprised, this time with full orchestra and bells signifying the victory over the French. Name this 1882 work in which bass drums are sometimes substituted for cannons in Tchaikovsky's original score.

Answer: **The 1812 Overture** (*accept Festival Overture*)

Bonus 11: Math (General)

Find the square root of each of the following large numbers. Each of these four numbers is a perfect square.

A: 784

B: 3,136

C: 5,776

D: 10,609

Answers: A: **28** B: **56** C: **76** D: **103**

Tossup 12: Literature (Literature)

The titular character of this work stays locked in his workroom for a week, which prompts his butler to suspect foul play and send for the protagonist, Gabriel John Utterson. Together, they break down the door and discover that the title character has committed suicide in his alternate form. Name this work by Robert Louis Stevenson, in which a doctor drinks a potion and transforms into a form of pure evil.

Answer: **The Strange Case of Dr. Jekyll and Mr. Hyde** (*Accept Jekyll and Hyde*)

Bonus 12: Social Studies (Current Events)

Name the current heads of state of the following countries.

A: Prime Minister of Canada

B: President of Ukraine

C: Prime Minister of Japan

D: Chancellor of Germany

Answers: A: **Stephen Harper** B: **Viktor Yushchenko** C: **Shinzo Abe** (*accept Abe Shinzo, prompt Shinzo*) D: **Angela Merkel**

Tossup 13: Science (Physics)

Because it is electrically neutral and a lepton, it only interacts by the weak nuclear force and gravity, but has so little mass that it would take a light-year-thick block of lead to stop only half of the ones passing through. Existing in the electron, muon, and tau flavors, name this weakly-interacting particle whose name was given by Enrico Fermi, the diminutive of "neutral" in Italian.

Answer: **Neutrino**

Bonus 13: Miscellaneous (Entertainment)

Identify the following characters from television, movies and video games. Include both first and last names in your answers.

A: Played by John Krasinski, this character is a five year veteran of Dunder-Mifflin Paper Company.

He secretly harbored feelings for Pam, the secretary, before these became public on 'Casino Night'.

B: He was incarcerated for armed robbery before being released into his brother's custody. His jilted fiancée comes after him multiple times, including once with a rocket launcher.

C: This character wears a full-body Power Suit, which features an arm cannon and allows her to morph into a ball.

D: This man, played by Wentworth Miller, was a structural engineer prior to his incarceration at Fox River State Penitentiary.

Answers: A: **Jim Halpert** (from NBC's *The Office*) B: "**Joliet**" **Jake E. Blues** (prompt on "*Joliet*" *Jake*) (from *The Blues Brothers*) C: **Samus Aran** (from Nintendo's *Metroid* series) D: **Michael**

"Fish" Scofield (from Fox's *Prison Break*)

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

Prompting this case, shortly before his term ended, President John Adams passed a number of "midnight appointments" for new federal justices, though the next president, Thomas Jefferson, had one of his cabinet members refuse to acknowledge some of them. In this Supreme Court case, one of the men who was disallowed an appointment brought suit against the new Secretary of State, claiming that he had a right to his appointment as a judge. Name this 1803 landmark Supreme Court case in which Chief Justice John Marshall affirmed the practice of judicial review.

Answer: **Marbury v. Madison** (Prompt on just *Marbury* or *Madison*)

Bonus 14: Science (Chemistry)

Give the charges of the following ions.

A: Chlorate

B: Phosphate

C: Ammonium

D: Hydride

Answers: A: **-1** B: **-3** C: **+1** D: **-1**

Tossup 15: Math (Geometry) -- Computational (30 Seconds)

Convert the polar coordinate (10, 135 degrees) into Cartesian rectangular form. It may help you to know that 135 degrees is in the second quadrant, and therefore cosine is negative while sine is positive.

Answer: **(-5√2, 5√2)**

Bonus 15: Literature (Literature)

Given a title, identify its African-American author.

A: Invisible Man

B: Native Son

C: The Temple of my Familiar

D: I Know Why the Caged Bird Sings

Answers: A: **Ralph Ellison** B: **Richard Wright** C: **Alice Walker** D: **Maya Angelou**

Tossup 16: Literature (Literature)

This 20th century author was mainly an essay writer but also wrote poetry and children's books. He won a Pulitzer Prize special citation in 1978 for his writings in the New Yorker. Name this American author who is most famous for writing the essay "Once More to the Lake" and the children's books The Trumpet of the Swan, Stuart Little, and Charlotte's Web.

Answer: **E(lwyn) B(rooks) White**

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

Given a description, identify the U.S. Secretary of Defense.

A: This Secretary under George W. Bush resigned in December of 2006.

B: This man, who served as Secretary of Defense from 1961-1968 under John F. Kennedy and Lyndon B. Johnson, was once president of Ford Motor Company.

C: This man was the very first Secretary of Defense. He served under Harry Truman.

D: This Secretary of Defense under Truman was more famous for a "plan" he made to halt the spread of communism.

Answers: A: **Donald Henry Rumsfeld** B: **Robert Strange McNamara** C: **James Vincent Forrestal**
D: **George Catlett Marshall, Jr.**

Tossup 17: Miscellaneous (Sports)

Max Winter announced that his Minnesota team would accept a bid from the NFL as an expansion team, allowing this team to join the AFL in 1960. When AFL commissioner Joe Foss resigned in 1966, Al Davis took over the position, but when plans for a merger between the two leagues were announced, he returned to his original post as a manager of this team, a team he now owns. Name this NFL team which relocated to Los Angeles in 1982 and back to its original city in 1995.

Answer: **Oakland Raiders** (*accept either half of name; do not accept Los Angeles Raiders*)

Bonus 17: Math (Geometry)

Find the degree measure of an interior angle of each of the following regular polygons.

A: Dodecagon

B: 36-gon

C: 80-gon

D: 360-gon

Answers: A: **150 degrees** B: **170 degrees** C: **175.5 degrees** (*accept 351/2*) D: **179 degrees**

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

Greg's allowance is tied to his performance on statistics tests at the end of the semester. His scores so far are 83, 91, 91, 90, 89, and 84. The upcoming final is weighed at four times the score of the previous tests. Greg earns \$50 for reaching 90%, and earns an extra \$10 for each integer percentage point above 90%. What is the maximum amount Greg can earn, if the maximum he can score on the final is 100?

Answer: **70 dollars**

Bonus 18: Literature (Literature)

Identify the following ideal places from literature.

A: The ideal place created by Sir Thomas More.

B: The ideal locale created by James Hilton in Lost Horizon.

C: This splendorous place is known for caves of ice and a stately pleasure-dome.

D: Created by Samuel Butler, this ideal place is a satire of Victorian society.

Answers: A: **Utopia** B: **Shangri-La** C: **Xanadu** D: **Erewhon**

Tossup 19: Science (Astronomy)

It is considered a planet because it has one twelfth the mass necessary to burn deuterium, though it is still so massive that its barycenter with the sun is only slightly above the sun's surface. With a small rock core, it is composed mostly of metallic, liquid, and gaseous hydrogen. Name this largest planet that has a large storm called Great Red Spot.

Answer: **Jupiter**

Bonus 19: Fine Arts (Visual Art)

Though it may pose a stretch to the definitions of both "fine" and "art," answer these questions about twentieth century sculpture. Given the name of the artwork, name the artist.

A: Lobster Trap and Fish Tail

B: Bird in Space

C: Fountain

D: Love

Answers: A: **Alexander Calder** B: **Constantin Brancusi** C: **Marcel Duchamp** D: **Robert Indiana**

Tossup 20: Social Studies (World History)

It is possible that it was actually a siege machine, given that the Assyrians named their machines similarly. Idomeneus, Philoctetes and Neoptolemus were some of the forty men involved with it. Built by Epeius and commanded by Odysseus, identify this structure, wheeled into the gates of Ilium, from which warriors emerged.

Answer: **Trojan horse**

Bonus 20: Science (Physics)

Identify these terms related to nuclear reactors.

A: Heavy water or graphite can serve as this type of medium that slows down neutrons.

B: In contrast, this type of material absorbs neutrons to keep the fission under control, and can be fully lowered into the central core to stop a reactor.

C: This term that is not "slow" refers to reactors that do not use fast neutrons, instead slowing down the neutrons to the kinetic energy of surrounding materials.

D: This type of reactor is designed to create more fissile fuel than it uses.

Answers: A: **Neutron moderator** B: **Control rod** C: **Thermal reactor** D: **Breeder reactor**

TIEBREAKERS/REPLACEMENTS:**Tossup 21: Social Studies (Other)**

Some famous examples include the lady or the tiger, Gabriel's horn, the Chinese room, and the Ship of Theseus. Though they have long existed, the term was coined in German by Hans Christian Oersted in 1812, and refers to an invented scenario proposed to help further understanding. Name this type of experiment that is never performed, most famously used in physics, including the twin paradox, Newton's cannonball, and Schrödinger's cat.

Answer: **Thought experiment**

Bonus 21: Science (Chemistry)

Give the number of equivalents in one mole of each of the following acids.

A: Sulfuric acid

B: Nitric acid

C: Propanoic (*PROH-puh-NOH-ick*) acid

D: Phosphoric acid

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



Aegis Questions

**District 207 Championship 2007
Frosh-Soph Round 3**

Tossup 1: Social Studies (Geography)

It is located near Tortuga Island, and natives called it Quisqueya (*kees-KAY-yuh*). It's highest point is Duarte Peak, and the first European to spot it was Christopher Columbus in 1492, whose name for it translated to "The Spanish Island." Name this Caribbean island, formerly known as Santo Domingo, comprised of Haiti and the Dominican Republic.

Answer: **Hispaniola**

Bonus 1: Literature (Literature)

Though J.K. Rowling's style is simple enough for her kiddie audience, the Harry Potter series is replete with mythological and literary allusions, particularly in her naming of characters. From the explanation of a character's name, give their full name – first and last.

A: He shares his first name with a cruel Athenian lawmaker, and his last name is old French for "bad faith."

B: Her first name alludes to the Roman goddess of wisdom, and she shares her last name with the man generally regarded as the worst poet in English history.

C: His first name alludes to a mythical Greek demon associated with avenging blood feuds before being slain by Heracles. His last name means temperamental.

D: He shares his first name with an ancient co-founder who was raised by wolves. His last name is French for wolf-like.

Answers: A: **Draco Malfoy** B: **Minerva McGonagall** C: **Alastor Moody** (*begrudgingly accept Mad-Eye Moody*) D: **Remus Lupin**

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

What is the probability of rolling five of the same number with five six-sided dice? This can be found by assigning a probability of one to the first roll to indicate that the first number's identity does not matter, or by multiplying the probability of rolling five of a certain number by six to account for six different possibilities, but not both. Using these or any other method, find the probability of rolling five of a kind using five dice.

Answer: **1/1296**

Bonus 2: Science (Astronomy)

Given the nomenclature of a planet's moons, name the planet.

A: This planet has two moons, which were both named by Asaph Hall after two sons of Ares and Aphrodite.

B: This planet has three moons, Hydra, Nix, and the largest one, named after the ferryman of Styx.

C: This planet's moons are named after Greek sea deities.

D: This planet's moons are named after characters from Shakespeare and Pope.

Answers: A: **Mars** B: **Pluto** C: **Neptune** D: **Uranus**

Tossup 3: Miscellaneous (Entertainment)

Upon entering his workplace, the protagonist is scolded by his colleagues for being late again, and is told to quickly put on his hazardous environment suit and get to the test lab. During the experiment, however, space-time is ripped apart by a resonance cascade, which causes Xen aliens to begin entering the partially-destroyed Black Mesa Research Facility. It is up to the protagonist to travel to Xen and destroy the dimensional portal, with the help of pistols, machine guns, and of course, a crowbar. Name this hit 1998 first-person shooter produced by Valve Studios, which stars Dr. Gordon Freeman.

Answer: **Half-Life 1** (*do not accept or prompt "Half-Life 2"*)

Bonus 3: Social Studies (Geography)

Identify these Asian countries ending with "-stan."

A: It is involved in a territorial dispute over Kashmir.

B: Named for the Cossacks, it is the home of fictional character Borat.

C: Its capital city is Bishkek, and it shares a border with China.

D: Home to Samarkand, it was the seat of Tamerlane's empire.

Answers: A: **Pakistan** B: **Kazakhstan** C: **Kyrgyzstan** D: **Uzbekistan**

Tossup 4: Science (Chemistry)

Its name is derived from the Greek for "stone," because it was first isolated from minerals. Though it oxidizes too quickly to exist in a pure form, it is used in many forms, including its stearate as a lubricant, and its deuteride to produce tritium in hydrogen bombs. Most common, however, is its use in batteries, producing 3 instead of 1.5 volts due to its high electrochemical potential. Name this element, the lightest member of the alkali metals with an atomic weight of 3.

Answer: **Lithium**

Bonus 4: Math (Algebra)

Given a matrix with top row 3, 4, and bottom row 2, 1, find the following quantities.

A: Find the determinant of the matrix.

B: Find the trace of the matrix.

C: Find the transpose of the matrix.

D: Find the inverse of the matrix.

Answers: A: **-5** B: **4** C: **Top row 3, 2; bottom row 4, 1** (*accept equivalent, but numbers must be in correct places!*) D: **Top row -1/5, 4/5; bottom row 2/5, -3/5** (*accept equivalent, accept decimals instead of fractions*)

Tossup 5: Literature (Literature)

His first play to be produced on Broadway, "The Man Who Had All The Luck," earned a Theater Guild National Award, but closed after only a handful of performances. Three years later, he earned his first commercial success and two Tony Awards in 1947 with a play revolving around Joe Keller, "All My Sons." His struggles with the House Un-American Activities Committee provided inspiration for one of his most famous works. Name this American playwright, famous for an allegorical play illustrating America's struggles with Communism, "The Crucible."

Answer: **Arthur Miller**

Bonus 5: Fine Arts (Visual Art)

Identify the following architects, given a work or two.

A: The Guggenheim Museum in New York

B: The glass pyramid at the Louvre; The Rock and Roll Hall of Fame

C: The original building of the Milwaukee Art Museum; The Gateway Arch

D: The Guggenheim Museum in Bilbao, Spain

Answers: A: **Frank Lloyd Wright** B: **leoh Ming Pei** C: **Eero Saarinen** D: **Frank Owen Gehry** (*also accept Ephraim Owen Goldberg*)

Tossup 6: Math (Algebra) -- Computational (30 Seconds)

Express your answer as a fully simplified fraction. The Cubs and Cardinals are set to play an exhibition 3 game series. It is assumed that the chance of the Cubs winning a single game against the Cardinals is 40 percent. What is the probability that the Cubs win the series by taking 2 of 3 games or by sweeping all 3?

Answer: **44/125**

Bonus 6: Literature (Mythology)

Answer the following questions from The Odyssey of Homer...Simpson. Of course, all answers correlate to the epic of Odysseus' return from Troy.

A: Patty and Selma oddly represent these women, who almost lure the men to their deaths before they sail away in disgust.

B: This woman turns Homer's shipmates into pigs, which are then eaten by Homer. She informs Homer that he has eaten his friends, much to his horror. Of course, she then reveals that she'd been saying that for hours.

C: The song "Lady" plays in the background as Homer traverses this body of water on his return trip to Ithaca. Homer's response to the sight of skeletons rocking out is, "Oh, this truly is hell!"

D: Though he didn't make an appearance, Santa's Little Helper would have represented what faithful dog of Odysseus?

Answers: A: **The Sirens** B: **Circe** C: **The River Styx** D: **Argos**

Tossup 7: Social Studies (Current Events)

Though it has been long speculated that he is gay, this was only confirmed by his lawyer in early October 2006, along with the fact that he was sexually abused by a clergyman in his early teenage years. These facts surfaced after he resigned from his position because some of his explicit instant message conversations with male Congressional pages were made public, and ironically, he might get charged under some of the new laws he helped pass. Name this former U.S. Representative from Florida, who resigned on September 29, 2006.

Answer: **Mark Foley**

Bonus 7: Miscellaneous (Interdisciplinary)

Answer the following questions about islands found in the Aegean Sea from clues that have nothing to do with the geography.

A: A work by Delacroix portrays a massacre at this island, home to an 1822 rebellion against the Turkish rulers.

B: This island is most famous for a statue roughly the size of the Statue of Liberty; the statue is considered one of the Seven Wonders of the Ancient World.

C: This island was home to one of the nine canonical lyric poets of Ancient Greece; Plato called her the tenth muse, and scholars wonder whether the Cleis in her poems refer to a daughter or simply a young girl.

D: According to myth, Hephaestus landed on this island when Zeus threw him from Mount Olympus. The island was home to his forge, and myths tell of fire that could be seen rising from the mountains.

Answers: A: **Chios** (*KEE-ose*) B: **Rhodes** (*The Statue of Zeus was in Olympia, on the Greek mainland.*) C: **Lesbos** D: **Lemnos**

Tossup 8: Fine Arts (Music)

This composer helped develop the baroque concerto, which influenced Johann Sebastian Bach and other symphony composers. He wrote most of his works for the violin, but also composed operas, oratorios, cantatas, and sonatas. Name this Italian composer, best known for his four violin concertos known as The Four Seasons.

Answer: **Antonio Vivaldi**

Bonus 8: Math (Geometry)

Name the number of faces that the following solids have.

A: Tetrahedron

B: Icosahedron

C: Parallelepiped (*PAIR-a-LEL-ih-PIE-ped*)

D: Dodecahedron

Answers: A: 4 B: 20 C: 6 D: 12

Tossup 9: Science (Biology)

The only parazoans still in existence, these sessile animals act very much like colonies of choanoflagellates (*koh-ANN-oh-FLAJ-uh-LITS*), from which they probably evolved. They produce a chemical called vidabarine, which might be useful against AIDS, but contrary to popular belief, they are not used as loofahs (*LOO-fahz*). Name this animal phylum that doesn't have true tissues, the simplest living animals, whose use for humans has been largely supplanted by cellulose alternatives.

Answer: Porifera (*accept sponges*)

Bonus 9: Social Studies (U.S. History)

Given an American Civil War battle, name what state it was fought in.

A: The Battle of Shiloh

B: The Battle of Vicksburg

C: First Battle of Bull Run

D: Battle of Chickamauga

Answers: A: Tennessee B: Mississippi C: Virginia D: Georgia

Tossup 10: Literature (Language Arts)

A nine-letter word ending in 'L,' fame is often said to have this quality, as summarized in Andy Warhol's famous "fifteen minutes" maxim. It can also describe the life of a mayfly or the presidency of William Henry Harrison. Identify the word meaning short-lived or momentary beginning with the letter 'E.'

Answer: Ephemeral

Bonus 10: Science (Physics)

The CGS system is the same as the SI system, except its units are based on centimeters, grams, and seconds, instead of meters, kilograms, and seconds. Given a CGS unit, name the physical quantity it measures.

A: Dyne

B: Barye

C: Erg

D: Esu

Answers: A: Force (*accept weight, do not accept mass*) B: Pressure C: Energy (*accept work*) D: Electric charge

HALFTIME

Tossup 11: Literature (Mythology)

She was the daughter of King Cephus and Queen Cassiopeia of Joppa. After her mother angered Poseidon by boasting about her beauty, a sea monster was sent to ravage her homeland, causing her father to make preparations to sacrifice her in an attempt to drive the monster away. Name this mythical figure who was rescued by Perseus.

Answer: **Andromeda**

Bonus 11: Math (General)

Given two numbers in a Pythagorean triple, find the third. Remember, a Pythagorean triple consists of three integers, where one of their squares equals the sum of the other two squared.

A: 9 and 40.

B: 21 and 29.

C: 8 and 17.

D: 24 and 25.

Answers: A: **41** B: **20** C: **15** D: **7**

Tossup 12: Science (Chemistry)

This standard set of conditions is used for experimental measurements. These conditions are held constant so that other factors such as volume or volumetric flow can be compared without any variables present. The definition of these conditions changed in 1997 when IUPAC changed one aspect from one atmosphere to one bar. Now, when these conditions are present, one mole of gas occupies 22.4 liters. What name refers to gas at 101 kiloPascals and 273 Kelvin?

Answer: **STP** (*Standard Temperature and Pressure*)

Bonus 12: Social Studies (World History)

Identify these facts related to a November 5th, 1605 event.

A: English Roman Catholics were intending to blow up this governmental structure.

B: The assailants also intended to kill this then current monarch and members of his family.

C: The event became known as this plot.

D: November 5th is now named after this man, who was discovered on the night of November 4th.

Answers: A: **Parliament** B: **James I** (*prompt on James*) C: **Gunpowder Plot** D: **Guy Fawkes**

Tossup 13: Fine Arts (Visual Art)

The man at the center of this painting is kneeling with his hands over his head. The people around him are shielding their eyes from looking at him as the soldiers on the other side of the painting prepare to shoot the man. Name this example of romantic art, a painting by Spanish artist Francisco Goya.

Answer: **Execution of the rebels of the 3rd of May, 1808**

Bonus 13: Science (Astronomy)

Given a planet or moon, name who discovered it.

A: Uranus

B: Io

C: Pluto

D: Charon

Answers: A: **William Herschel** (*Accept John Flamsteed*) B: **Galileo Galilei** (*Prompt on Galilei*) C:

Clyde W. Tombaugh D: **James W. Christy**

Tossup 14: Social Studies (Other)

The first recorded use of the term was in 1937, referring to the bombing of Guernica, Spain, though this usage would be overshadowed in under a decade, when the Atomic Energy Commission applied it to atomic weapons. In 1972, it was expanded to include biological and chemical weapons. The term came back into vogue in the early 21st century, leading to its nomination as the American Dialect Society's "word of the year" in 2002. Name this phrase referring to highly potent nuclear, biological, and chemical weapons, a cornerstone of the United States' justification for invading Iraq in 2003.

Answer: **Weapon(s) of Mass Destruction** (accept WMDs)

Bonus 14: Literature (Language Arts)

English has many calques, that is, phrases taken from direct translations of sayings from other languages. For example, "blue blood" is a calque from the Spanish "sangre azul" meaning the same thing. Given a phrase, name the language it came from.

A: Paper tiger

B: Moment of truth

C: Vicious circle

D: Overman

Answers: A: **Chinese** B: **Spanish** C: **Latin** D: **German**

Tossup 15: Math (Algebra) -- Computational (30 Seconds)

Find the sum of the solutions to the equation two x cubed plus four x squared minus 22 x minus 24 equals zero. Because all of its roots are integers, they can be found by trial and error. However, since only their sum is requested, it would be much faster to remember the relation between the sum of a polynomial's roots and its second term.

Answer: **-2** (do not accept 2; roots are -1, -4, and 3)

Bonus 15: Miscellaneous (Entertainment)

Given the abbreviation of a rock 'n roll band, give the band's full name.

A: CCR

B: O.A.R

C: ELO

D: BTO

Answers: A: **Credence Clearwater Revival** B: **Of A Revolution** C: **Electric Light Orchestra** D: **Bachman-Turner Overdrive**

Tossup 16: Literature (Literature)

The title of this work is a reference to Chaucer, but the society examined by the novel is steeped in Biblical allusions. The main character's status is much like those of Zilpah and Bilha, who performed the title role for Jacob's wives Rachel and Leah. Women are subverted completely in this novel, set in the Republic of Gilead. Name this dystopian novel by Margaret Atwood.

Answer: **The Handmaid's Tale**

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

Identify these people related to the 1912 Presidential election.

A: This incumbent lost his bid for the White House; he later served as Chief Justice.

B: This former President ran on the ticket of the Progressive party, which was nicknamed the Bull Moose party.

C: This Democrat won the election.

D: This man ran for the fourth time on Socialist party ticket.

Answers: A: **William Howard Taft** B: **Theodore "Teddy" Roosevelt** (*prompt on Roosevelt*) C: **Thomas Woodrow Wilson** D: **Eugene Victor Debs**

Tossup 17: Miscellaneous (Interdisciplinary)

In 1995, a hurricane by this name hit Mexico and caused in the neighborhood of 1.5 billion dollars in damage. In that same year, 'A Goofy Movie' sees her as the dream date of Goofy's son, Max. Coming from the Persian, it is the usual westernized form of the name of Alexander the Great's wife who bore him a child six months after his death. She is loved by Christian de Neuvillette in Rostand's *Cyrano de Bergerac*. Daryl Hannah plays the title role in the 1987 Steve Martin film based on Rostand's work. Identify this girl's name, who "don't have to put on the red light" in a 1978 single from The Police.

Answer: **Roxanne** (*also accept Roxana, though this really only applies to the Alexander clue*)

Bonus 17: Science (Physics)

Given an equation, name each famous law from physics.

A: $F = ma$

B: $V = IR$

C: $n \sin \theta_1 = n_2 \sin \theta_2$

D: $F = -kx$

Answers: A: **Newton's Second Law of Motion** (*prompt on Newton's Law of Motion*) B: **Ohm's Law**

C: **Snell's Law** D: **Hooke's Law**

Tossup 18: Science (Biology)

Hydrolyzing its gamma group generates 12 kilocalories per mole, a highly exergonic reaction that is later reversed by the citric acid cycle. Taking the structure of a purine group attached to a ribose sugar and up to three phosphate groups, name this molecule, whose third phosphate group is removed to power cellular processes, known as the energy currency of all living cells.

Answer: **ATP** (*accept adenosine triphosphate*)

Bonus 18: Fine Arts (Music)

Name these nationalistic composers.

A: This Finnish composer of *The Swan of Tuonela* is more famous for his *Finlandia*.

B: This Bohemian composer showed the influence of folk music in such works as his *Slavonic Dances*, the opera *Rusalka*, and his famous nicknamed *Ninth Symphony*, which was supposedly influenced by American spirituals.

C: This Hungarian composer of *Romanian Folk Dances* is perhaps better known for *Mikrokosmos* and his opera, *Duke Bluebeard's Castle*.

D: This Norwegian composer is best known for his incidental music for Henrik Ibsen's play, *Peer Gynt*, which contains the famous piece, *In the Hall of the Mountain King*.

Answers: A: **Jean Sibelius** B: **Antonin Dvorak** C: **Bela Bartok** D: **Edvard Grieg**

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

Jack has ordered a miscast coin so that instead of having even odds of flipping heads or tails, heads should come up only 40% of the time. He's trying to figure out the probability that four consecutive flips will be heads. Knowing that 40% can be converted to the fraction two-fifths, Jack can use a simplified form of the binomial theorem to do the calculation. What is the probability that Jack's coin will flip heads four consecutive times?

Answer: 16/625

Bonus 19: Literature (Literature)

Identify the author of these works of medieval literature.

A: The Parliament of Fowls

B: Le Morte d'Arthur

C: The Rubaiyat

D: The Faerie Queen

Answers: A: **Geoffrey Chaucer** B: **Sir Thomas Malory** C: **Omar Khayyam** D: **Edmund Spenser**

Tossup 20: Social Studies (World History)

He is the narrator of the musical 'Evita', though this situation is entirely fictional; he never actually met Eva Perón. He dreamed of a united 'Ibero-America', without borders and bound together by a common mestizo culture. Born in Argentina, this Marxist revolutionary led guerrilla movements in Guatemala, Cuba, the Congo, and Bolivia, where he finally met his end. Identify this man, probably most famous for his Motorcycle Diaries and a contrast photo of him that is frequently used on T-shirts.

Answer: **Ernesto "Che" Guevara de la Serna**

Bonus 20: Math (Algebra)

Solve the following equations for x.

A: The absolute value of 3x minus 2 equals 10.

B: The square root of 2x plus 4 equals 4.

C: 10x minus 11 is greater than or equal to 5x plus 1.

D: 12 minus x squared equals 4x.

Answers: A: **x equals 4 and -8/3** (must have both, do not prompt on one) B: **x equals 6** C: **x is greater than or equal to 12/5** (or 2.4) D: **x equals 2 and -6** (must have both, do not prompt on one)

TIEBREAKERS/REPLACEMENTS:**Tossup 21: Science (Chemistry)**

If they occur in larger molecules, they are called zwitterions. If they have a hydroxide ion, they are called basic, and if they have a hydrogen ion, are called acid. They must be neutral, and contain at least two atoms, though sometimes they may contain many more. Usually crystalline, what is this term from chemistry referring to a neutral ionic compound, a term that more commonly refers to only sodium chloride?

Answer: **Salt**

Bonus 21: Social Studies (World History)

Identify these facts related to the Congress of Vienna.

A: The Congress was set up to reorganize Europe after this man fell from power. He returned from Elba during the conference.

B: This Austrian diplomat headed the proceedings.

C: This man was the first British representative.

D: This nobleman, who went through the French Revolution virtually unscathed, was the French representative at the conference.

Answers: A: **Napoleon Bonaparte** (*accept Bonaparte*) B: **Prince Klemens Wenzel von Metternich**

C: **Viscount Castlereagh** (*accept Robert Stewart*) D: **Charles Maurice de Talleyrand-Périgord, Prince de Benevente**