Tossup 1: Social Studies — World History

Named after its country's Minister of War in the 1920s and 30s, it was not meant to completely defend the country, but merely to give its military time to mobilize. It was built with the intent of helping repel a German attack, but it ended up being inconsequential as the Germans simply went around it through Belgium. Name this string of fortifications on France's eastern border.	**Maginot Line**

Bonus 1: Literature — Literature

Identify the authors of the following dramatic works of literature.		
A	Radio Golf	**August Wilson**
B	The Misanthrope	**Molière** *(accept Jean-Baptiste Poquelin)*
C	Arcadia	**Sir Tom Stoppard**
D	The Suppliants	**Aeschylus**

Tossup 2: Math — General

They can be calculated non-recursively using Binet's formula, and their ratio approaches one half of the quantity one plus root five. They are closely related to the Lucas numbers, and any three consecutive ones, taken two at a time, are relatively prime. Found in sunflowers, pineapples, and pine cones, name this sequence of numbers that starts 0, 1, 1, 2, 3, 5.	**Fibonacci numbers/sequence/series**

Bonus 2: Science — Biology

Identify these terms related to muscles in the human body.		
A	There are three kinds of muscles. Cardiac muscle is an involuntary muscle only found in the heart. This is the other kind of involuntary muscle, named after its appearance.	**Smooth muscle**
B	The third type of muscle is voluntary, and is called this, after the fact that they are usually attached to bones to allow for motion.	**Skeletal muscle** *(accept striated muscle)*
C	This basic unit of muscles is separated by Z-lines, and contains actin and myosin.	**Sarcomere**
D	Release of this metal ion within the muscle causes muscles to contract.	**Calcium**

Tossup 3: Literature — Literature

The author finished this work as he was running out of both the ink he used to write it, and the time he was allotted by his publisher. The book's storyline was conceived when the writer discovered the Greek word for "need" carved on a wall, and became curious about the origin of the carving. Featuring a lustful priest and a captain of the King's Archers who isn't really dead, name this novel by Victor Hugo, also featuring a deaf bell-ringer named Quasimodo.	**The Hunchback of Notre Dame** *(accept Notre-Dame de Paris)*

Bonus 3: Social Studies — Other

Name these behaviorial psychologists.		
A	This Russian is considered to be a forerunner of behaviorism, working on classical conditioning experiments with salivating canines.	**Ivan Pavlov**
B	This man is considered the founder of behaviorism. He may be most famous for his “Little Albert” experiment.	**John Watson**
C	This one-time Harvard professor conducted experiments in operant conditioning, one involving his namesake box which administered food to a rat when it pressed a lever.	**Burrhus Frederic Skinner**
D	This American postulated the law of effect in operant conditioning and primarily worked with cats in puzzle boxes.	**Edward Thorndike**

Tossup 4: Science — Chemistry

This force is thought to be present between setae and other surfaces, allowing geckos to climb walls. It is present in all molecules, but becomes more significant as the size of molecules increases. For example, this force causes bromine to be a liquid and iodine to be a solid, while lighter halogens are gaseous. Sometimes called the Van der Waals force, it is more commonly named after a German scientist. Name this weakest form of intermolecular force, an attraction between momentary dipoles.	**London dispersion force** *(accept dispersion force, prompt Van der Waals force)*

Bonus 4: Literature — Literature

Identify the following sovereign works of literature.		
A	This poem by Robert Browning is a dramatic monologue about a gallery of artwork, focusing on one in particular.	**My Last Duchess**
B	This work by Robert Penn Warren is about the decline of Willie Stark, who was probably modeled on Huey Long.	**All The King's Men**
C	This Edmund Spenser work, written in praise of Queen Elizabeth I, has six books that each represent a virtue.	**The Faerie Queen**
D	This 1881 work tells the story of Tom Canty and Prince Edward, who happen to look exactly alike.	**The Prince and the Pauper**

Tossup 5: Social Studies — Geography

In ancient times, it was named the "Gibraltar of the North" because it was located on a road connecting Germanic and Frankish tribes. A portion of the Ardennes forest lies within its boundaries, as does the Alzette River, while the Moselle River lies on its German border. Name this tiny European country that forms an economic union with Belgium and the Netherlands and is a Grand Duchy.	**Grand Duchy of Luxembourg**

Bonus 5: Math — Geometry

Find the following quantities related to the coordinate plane.		
A	The midpoint of the line segment with vertices at (2, 7) and (10, 13).	**(6, 10)**
B	The centroid of a triangle with vertices at (2, 4), (6, 10), and (13, 7).	**(7, 7)**
C	The slope of a line perpendicular to the line $3x + 5y = 7$.	**5/3**
D	The area of a triangle with vertices at (3, 3), (5, 6), and (10, 13).	**1/2** *(accept 0.5)*

Tossup 6: Fine Arts — Music

This type of musical ornamentation was played by Ross Gorman to great acclaim in 1924. Common to both vocal and instrumental jazz, this technique is often used by trombones. Best known as the opening of Gershwin's Rhapsody in Blue, name this term for a the smooth ascent or descent between two widely separated notes.	**Glissando** *(Prompt on gliss)*

Bonus 6: Science — Physics

Name these physical quantities related to rotation.		
A	Analogous to force, this is equal to the cross product of the lever arm and force.	**Torque**
B	Denoted capital i *(eye)*, this quantity is similar to mass, and represents an object's resistance to rotation.	**Moment of inertia**
C	This quantity is equal to the cross product of r and p.	**Angular momentum** *(prompt momentum)*
D	The three axes of rotation for an object are called roll, pitch, and this.	**Yaw**

Tossup 7: Science — Astronomy

Contained within a constellation named after the mythological figure Chiron *(KY-ron)*, this star system looks like a single point but is actually composed of three stars. Two of those stars form a binary system together; the third star is a red dwarf much closer to Earth. Identify this closest star system to our Solar System at 4.37 light-years that, because of its proximity, is often referenced in works of science fiction.	**Alpha Centauri** *(accept Rigil Kentaurus)*

Bonus 7: Social Studies — U.S. History

Identify these African American ground breakers.		
A	This man was the first African American to serve in the U.S. Senate, when he did so while representing Mississippi in 1870 and 1871.	**Hiram Rhodes Revels**
B	This former NAACP lawyer was the first African American to serve on the U.S. Supreme Court.	**Thurgood Marshall**
C	This woman was the first African American female to be elected to the United States House of Representatives.	**Shirley Anita St. Hill Chisholm**
D	This man was the first African American to be nominated for U.S. President.	**Blanche Kelso Bruce**

Tossup 8: Miscellaneous — Sports

He was the first overall pick in the 1993 MLB draft after graduating from a Miami high school. In 1998 he had over 40 homeruns and stolen bases. He left the Seattle Mariners in 2000 and signed with the Texas Rangers, though a few years later he was traded for Alfonso Soriano. Name this current New York Yankee who has the richest contract in MLB history.	**Alexander Emmanuel Rodriguez** *(prompt on A-Rod)*

Bonus 8: Fine Arts — Visual Art

Identify the following artists from a description.		
A	Married to Frieda Kahlo, this man was an accomplished muralist.	**Diego Rivera**
B	This Mannerist was famous for works such as The Burial of the Count of Orgaz and View of Toledo.	**El Greco** *(accept Domenikos Theotokopoulos)*
C	This painter dabbled in other mediums as well, being responsible for Un Chien Andalou, a very strange movie.	**Salvador Dali**
D	This Flemish artist is famous for painting The Arnolfini Wedding as well as The Ghent Altarpiece.	**Jan van Eyck** *(prompt van Eyck)*

Tossup 9: Math — Geometry (Computational: 30 Seconds)

Find the length of an altitude of the equilateral triangle which has two vertices with coordinates (0,0) and (root 7, 3).	**2 root 3**

Bonus 9: Science — Chemistry

Name these laws of chemistry.		
A	This law states that the total pressure of a mixture of gases is equal to the sum of the pressures of each gas in it.	**Dalton('s) law of partial pressures** *(accept law of partial pressures)*
B	This law states that the rate at which heat is lost is proportional to the difference between the temperature of a body and the temperature of the environment.	**Newton('s) law of cooling** *(prompt law of cooling)*
C	This law states that the ratio of the rates of effusion of two gases is inversely proportional to the square root of the ratio of their molar masses.	**Graham('s) law of effusion**
D	This law states that every compound always has the same proportion of elements by mass.	**Law of definite proportions** *(accept law of constant composition)*

Tossup 10: Literature — Literature

In works such as "The American," this author explores themes of American naïveté among European society, themes that are common in his later works as well. He pioneers psychological realism in his novels The Ambassadors and The Wings of the Dove as well as in the short story The Beast in the Jungle. Identify this author of Daisy Miller and The Turn of the Screw.	**Henry James**

Bonus 10: Miscellaneous — Entertainment

Given a short description, name the product affiliated with Wizards of the Coast.		
A	This trading card game is renowned for such iconic creatures as Serra Angel and the Hurloon Minotaur.	**Magic: the Gathering**
B	This role-playing game, created by Gary Gygax, is soon to roll over to its fourth edition.	**Dungeons & Dragons** *(accept D & D)*
C	These collectible toys are based on an 1980's TV show, and more recently a movie with robots in disguise.	**Transformers**
D	This company, responsible for such games as Axis & Allies and Risk was bought out by Wizards in 1998.	**Avalon Hill**

END OF FIRST HALF – 2 minute timeout

Tossup 11: Science — Biology

The first discovered beta-lactamase *(LACK-tuh-MAZE)* inhibitor, before it was mass-produced, it was frequently combined with probenecid to reduce its rate of excretion. It works by preventing the synthesis of peptidoglycan in bacterial cell walls, and was thought to have saved the lives of up to 15 percent of injured troops in World War II. Discovered in 1928 by Alexander Fleming, name this famous antibiotic produced by a similarly-named mold.	**Penicillin**

Bonus 11: Math — Calculus

Evaluate the derivatives of the following functions at x equals zero.		
A	x squared plus 3 x plus 1.	**3**
B	The natural log of the quantity 2 x plus 4, close quantity.	**1/2** *(accept 0.5)*
C	One over the quantity x squared plus 1, close quantity.	**0**
D	The sine of x.	**1**

Tossup 12: Literature — Literature

Marie Cardona is the significant other of the title character of this novel, though he doesn't actually love her and won't marry her. The novel begins with him attending his mother's funeral, an event at which he shows little emotion, a display that later becomes a sticking point at his murder trial. The man he killed was an enemy of his friend Raymond Sintes, which highlighted the racial tensions of Algiers as the murdered man was an Arab. Name this Albert Camus novel about Meursault.	**The Stranger**

Bonus 12: Fine Arts — Music

Identify the following Classical compositions.		
A	This work by Mozart was left unfinished at his death. The Dies Irae only had the vocals completed, and the Lacrimosa only had eight bars finished.	**Requiem Mass in D Minor**
B	This symphony, originally dedicated to Napoleon, features a prominent funeral march and is twice as long as symphonies by Mozart and Haydn.	**Symphony No. 3 or Eroica Symphony**
C	Joseph Haydn's 93rd to 104th symphonies, including Surprise, Military, and Drumroll and sometimes named the Salomon symphonies, are named after this city.	**London Symphonies**
D	This opera by Mozart takes place in a Turkish harem and supposedly inspired Joseph II to say there were "too many notes."	**The Abduction from the Seraglio**

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

What is the geometric mean of 16 and 25?	**20**

Bonus 13: Science — Astronomy

Name these bodies in the solar system.		
A	This is the largest moon in the solar system.	**Ganymede**
B	This moon of Saturn is the second-largest moon in the solar system.	**Titan**
C	This second-largest dwarf planet's moons are named Nix, Hydra, and Charon.	**Pluto**
D	This comet named after an English astronomer can be seen about once every 75 years.	**Halley('s) comet**

Tossup 14: Miscellaneous — Entertainment

Members of this band, which formed in 1996, include Kyle Cook and Brian Yale. Their first album was Yourself or Someone Like You, which featured the hits Push and 3 A.M. In 1999, their lead singer teamed up with Carlos Santana for the song Smooth, and in more recent years he has had solo successes with songs such as Streetcorner Symphony. The songs Unwell and Disease debuted in 2002, but their most recent album is Exile on Mainstream. Name this band fronted by Rob Thomas who recently had a hit with How Far We've Come.	**Matchbox Twenty**

Bonus 14: Literature — Mythology

Identify the following important Hindu deities.		
A	Often depicted with a third eye and a blue neck, he is the destroyer of the Trimurti.	**Shiva**
B	This is the monkey-god who helps Rama on his journey to rescue Sita.	**Hanuman** *(accept Anjaneya)*
C	The eighth avatar of Vishnu, he is commonly depicted as a young cowherd boy or a young prince.	**Krishna**
D	His consort is Sarasvati and he is creator of the Trimurti.	**Brahma** *(do not accept Brahman)*

Tossup 15: Social Studies — U.S. History

It killed more than 2,000 people and wiped out over half of the town, and nearly 800 bodies were never identified. The Conemaugh *(KOH-nuh-maw)* River was typically held up by the South Forks Dam, but on May 31st, the Dam broke, unleashing a 30 foot wave on the town. Name this disastrous 1889 flood in Pennsylvania.	**Johnstown Flood**

Bonus 15: Math — Algebra

Given an eccentricity, identify what kind of conic section would have it.		
A	0	**Circle**
B	1/2	**Ellipse**
C	1	**Parabola**
D	3	**Hyperbola**

Tossup 16: Fine Arts — Visual Art

Much of this artist's work centers on two families, the Kuerners and the Olsons. The Kuerners were painted while he lived in Pennsylvania, and while in his native Maine he painted a picture of one of the Olsons lying in a field. A member of a famous family, his father went by the initials N.C. Name this painter of Christina's World.	**Andrew Wyeth** *(prompt on Wyeth)*

Bonus 16: Social Studies — World History

Identify the following 20th century female Asian leaders.		
A	The daughter of Jawaharlal Nehru, she served as Prime Minister of India for three terms before being assassinated by her own bodyguards.	**Indira Gandhi**
B	Helping merge the Mapai into the Labour Party, she succeeded Levi Eshkol as Prime Minister, and had tried to create a peace with the Arab states before the onset of the Yom Kippur War.	**Golda Meir**
C	The first female leader of a Muslim nation, this Pakistani leader led the opposition to Mohammad Zia-ul-Haq, but twice she was dismissed on charges of corruption.	**Benazir Bhutto**
D	The third wife of Mao Zedong, she was a member of the Gang of Four that fell from power after Mao's death.	**Jiang Qing** *(prompt on Qing)*

Tossup 17: Math — Algebra (Computational: 30 Seconds)

What is the sum of the coefficients of the expanded form of the quantity 2x plus 3y, quantity raised to the fifth power?	**3125**

Bonus 17: Miscellaneous — Entertainment

Identify these movies about government agents.		
A	Ryan Philippe played Eric O'Neill and Chris Cooper played Russian agent Robert Hanssen in this movie about Hanssen's spy career.	**Breach**
B	Matt Damon plays a ruthless Skull and Bones member in this 2006 drama.	**The Good Shepherd**
C	Damon also played the title character in this first member of a trilogy based on books by Robert Ludlum.	**The Bourne Identity**
D	Tommy Lee Jones and Will Smith played federal agents who combat aliens in this 1997 film.	**Men in Black**

Tossup 18: Social Studies — Geography

It is about 1,100 miles long and consists of roughly 15 large islands, and many more smaller ones, and two of its bigger island groups are Andreanof and the Islands of Four Mountains. It is the source of some seismic activity as it is located on the edge of the Pacific and North American plates, and it also separates the Pacific Ocean from the Bering Sea. Name this Alaskan island chain.	**Aleutian Islands**

Bonus 18: Literature — Literature

Identify these poets from a description.		
A	Born in 1888, this poet became known as one of the "Lost Generation." The winner of the 1948 Nobel Prize in Literature, he is famous for works including "Ash Wednesday" and "The Wasteland."	**T.S. Eliot**
B	One of England's most celebrated poets, this 17th-century writer wrote in many different genres, including history and prose. One of his most famous works, however, is "Samson Agonistes."	**John Milton**
C	This man played a large part in Weimar Classicism, along with Friedrich Schiller. His writings are still widely read and translated, especially "Erlkönig" and "The Sorrows of Young Werther."	**Johann Wolfgang von Goethe**
D	He was born to a rich Florentine family in 1265. Sadly, he was exiled from that city in the early 1300s. Name this poet, most famous for a three-part epic poem titled "La Commedia."	**Dante Alighieri**

Tossup 19: Science — Physics

The four- variety of this in special relativity generalizes this concept under Lorentz transformations. The Heisenberg uncertainty principle states that the more accurately this is known, the less accurately position can be determined. The time-derivative of this quantity is force, and the change in this is called impulse. Name this physical quantity equal to mass times velocity, symbolized p.	**Momentum**

Bonus 19: Math — General

Name the following mathematical constants.		
A	Also known as Archimedes' constant or Ludoph's number, this is the ratio of the circumference of a circle to its diameter.	**Pi**
B	This valuable constant is equal to half of the quantity 1 plus root 5, close quantity, and was thought by Greeks to be aesthetically pleasing.	**Golden ratio** *(accept golden mean)*
C	Also known as Napier's constant, this is the base of the natural logarithm.	**e** *(accept Euler's constant)*
D	Represented gamma, this is the difference at infinity between the harmonic series and the natural logarithm.	**Euler-Mascheroni constant**

Tossup 20: Literature — Literature

Famously called an "upstart Crow, beautified with our feathers" by playwright Robert Greene, this man penned poems addressed to a so called "Dark Lady" as well as the poems Venus and Adonis and The Rape of Lucrece. Identify this man, famous for leaving his wife with the second-best bed in his will as well as for writing such plays as Timon of Athens, Othello, and Romeo and Juliet.	**William <u>Shakespeare</u>**

Bonus 20: Social Studies — U.S. History

Identify these facts related to Hawaii.		
A	This man was the Kingdom of Hawaii's first monarch.	**<u>Kamehameha</u> I** *(kuh-MAY-huh-MAY-huh; accept <u>Kamehameha the Great</u>)*
B	This queen was the last Hawaiian monarch.	**Queen <u>Liliuokalani</u>** *(lil-LEE-oh-COO-lah-NI)*
C	Hawaii was annexed and became a U.S. Territory under this president.	**William <u>McKinley</u>**
D	Hawaii officially became a U.S. state in this year.	**<u>1959</u>**

END OF MATCH

Tossup A: Social Studies — Current Events

Ohio Congresswomen Jean Schmidt was once booed for insinuating that he was a coward on the House floor. In 2004, he was one of only two Congressmen to vote in favor of reinstating the draft. In 2006, he lost the race for majority leader to Steny Hoyer. Name this Pennsylvania Democrat who is among the most vocal opponents of the war in Iraq.	**John P. "Jack" Murtha**

Bonus A: Science — Chemistry

Theories of atomic structure have changed greatly over time. Identify the following scientists who contributed to atomic theory.		
A	This Greek philosopher and student of Leucippus was a proponent of atomism.	**Democritus**
B	This discoverer of the electron proposed the "plum pudding" model of the atom.	**Sir Joseph John Thomson**
C	This physicist theorized the existence of the nucleus after his famous gold foil scattering experiment.	**Ernest Rutherford**
D	This Danish physicist's model consisted of a positive nucleus, around which electrons orbit in quantized circular orbits.	**Niels Bohr**

Tossup B: Math — Algebra (Computational: 30 Seconds)

Calculate the sum of the determinant and trace of the following three-by-three matrix. The top row is 5, 2, 3. The middle row is 1, -1, 1. The bottom row is 2, 3, -4.	**32**

Bonus B: Fine Arts — Music

Identify the following brass instruments found in an orchestra.		
A	This is the only modern brass instrument not to feature valves.	**Trombone**
B	Derived from a post horn, this instrument resembles a short trumpet.	**Cornet**
C	This conical-bore brass instrument is very similar to a baritone.	**Euphonium**
D	Popularized by Miles Davis, this instrument is believed to have been invented by Adolphe Sax.	**Flügelhorn**

Tossup C: Literature — Literature

This man attended Indiana University, but did not graduate from there. He later worked in Chicago, the same city in which his first novel would be set. That work was about a girl named Caroline Meeber, though his most famous character was Clyde Griffiths, who was based on real life murderer Chester Gillette. Name this author of Sister Carrie and An American Tragedy.	**Theodore Herman Albert <u>Dreiser</u>**

Bonus C: Math — Other

You have a standard deck of 52 playing cards. Calculate the probability of the following events occurring, without replacement, expressing your answers as simplified fractions.		
A	You draw the queen of spades, followed by a heart.	**<u>1/204</u>**
B	You draw a spade, followed by a diamond.	**<u>13/204</u>**
C	You draw a diamond, followed by another diamond, followed by another diamond.	**<u>11/850</u>**
D	You draw a five, followed by a spade.	**<u>1/52</u>**

Tossup D: Miscellaneous — Interdisciplinary

Name the musical piece. In 1946, Warner Brothers released the animated short Rhapsody Rabbit featuring Bugs Bunny tryng to play the piano while a mouse interferes with his playing. This was released just weeks before MGM's Oscar winning The Cat Concerto, in which Tom and Jerry do the same thing. Uncannily, both Tom and Bugs are attempting to play the very same piece of music. Identify this piece of music, played in C-sharp minor, the second in a series of nineteen pieces, first published in 1858 by the composer, Franz Liszt.	**Hungarian Rhapsody** *(Number 2 in C-Sharp minor)*

Bonus D: Social Studies — Geography

Identify these cities along the Mississippi River.		
A	This 8th largest city in Iowa lies near both Illinois and Wisconsin.	**Dubuque**
B	This Missouri city is the namesake of a fault line that produced major earthquakes in the early 19th century.	**New Madrid**
C	This Mississippi city was the site of an 1863 siege.	**Vicksburg**
D	This capital of Louisiana lies on the river.	**Baton Rouge** *(BATT-in ROOZH)*

Tossup E: Science — Chemistry

According to Gibbs' phase rule for a single compound, P equals 3 when this happens, so there are no degrees of freedom. In other words, pure substances only have this at one temperature and pressure, which for water, are about 611 Pascals and 273.16 Kelvins. The exactness of this point makes it useful for calibrating thermometers, and is in fact part of the definition of a Kelvin. Name this point in a phase diagram at which the solid, liquid, and gas phases can all coexist.	**Triple point**

Bonus E: Literature — Literature

Answer the following questions from African literature.		
A	This impulsive warrior from Achebe's Things Fall Apart believes that he is the master of his fate, but when his gun accidentally explodes, killing a man, he is exiled.	**Okonkwo**
B	This son of the pastor Stephen Kumalo is convicted of killing Arthur Jarvis in Alan Paton's Cry, the Beloved Country.	**Absalom Kumalo**
C	This set of three works by Naguib Mahfouz consists of Palace Walk, Palace of Desire, and Sugar Street.	**The Cairo Trilogy**
D	This winner of the 1991 Nobel Prize for Literature is notable for her novel July's People and for her short stories.	**Nadine Gordimer**

