

Round 3

Bee Final Round

(Tossup 1) For a hollow sphere, this quantity is equal to two-thirds times mass times radius squared. The parallel axis theorem can be used to find this quantity about any axis after finding this property about the central axis. The product of angular velocity and this quantity is equal to angular momentum, and the product of angular acceleration and this quantity is equal to torque. For the point, name this quantity, the rotational analogue of mass, that is symbolized capital I.

ANSWER: moment of inertia (do not accept or prompt on inertia)

(Tossup 2) A character in this novel has a seizure while being interrogated by a severed animal head on a stick. A boy in this novel is repeatedly told “sucks to your ass-mar” and uses his glasses to start signal fires. Roger drops a boulder on Piggy and a conch shell used to signify authority in this novel. For the point, name this William Golding novel about a group of stranded English schoolboys.

ANSWER: Lord of the Flies

(Tossup 3) Sophie Germain’s Theorem is an examination of cases of this other theorem. A Diophantine [di-oh-fan-teen] equation inspired this idea, which the Taniyama-Shimura conjecture helped resolve. This idea was originally conjectured in 1637 in the margins of a math textbook, which were “too narrow” to contain its proof. Andrew Wiles was knighted for his work solving, For the point, what mathematical theorem regarding a modified form of the Pythagorean theorem?

ANSWER: Fermat’s Last Theorem

(Tossup 4) Fanya Kaplan attempted to assassinate this man and, as a result, was executed three days later. This politician made *Pravda* the official paper of his party in a move supporting his protégé, Leon Trotsky. The White Army opposed this man’s Bolsheviks, who seized power in the chaos after the fall of Nicholas II. Joseph Stalin succeeded, for the point, what founder of the Soviet Union?

ANSWER: Vladimir Lenin (or Vladimir Ulyanov)

(Tossup 5) Dietrich Buxtehude was a prolific baroque composer and performer of this instrument. This instrument gives the nickname to Camille Saint-Saëns’ third symphony. J.S. Bach’s *Toccatà and Fugue in D minor* was written for this instrument, on which low notes can be played using foot pedals. For the point, name this instrument that makes sounds through wind flowing through large pipes and is often found in churches.

ANSWER: pipe organ

(Tossup 6) In this author’s works, Nina is horrified by Konstantin Treplev’s gift of a dead bird, and Serebryakov is supported by Ivan Voynitsky. This author of *The Seagull* and *Uncle Vanya* wrote a play in which Madame Ranevskaya’s land is sold, including the title grove of fruit trees. For the point, name this Russian playwright of *The Cherry Orchard*.

ANSWER: Anton Pavlovich Chekhov

(Tossup 7) The binding affinity of these compounds is calculated in the Michaelis-Menten equation. In competitive inhibition, these compounds are blocked from reaching an active site. Emil Fischer compared these compounds to locks that needed a specific key, or substrate, to proceed. The suffix -ase [spell it], as in lactase, is used to name, for the point, what biological substances that speed up chemical reactions?

ANSWER: enzymes (prompt on catalysts)

(Tossup 8) In November 2017, the Ritz Carlton Hotel in this country's capital city began serving as a temporary prison for various members of its royal family. Prince Mohammed bin Salman has recently taken steps to liberalize this country's strict laws on the separation of sexes, including allowing women to begin driving. For the point, name this Middle Eastern country whose dominance of OPEC helps it maintain control over the price of oil from its capital of Riyadh.

ANSWER: Kingdom of Saudi Arabia

(Tossup 9) According to the Prose Edda, Vidar and Valí will be among the few to survive this event. During this event, the dog Garm will break free of his bindings and be killed by the god of war, and the Midgard Serpent will die before his poison destroys his lifelong enemy. This future event will include the deaths of Tyr, Loki, Thor, and Odin. For the point, name this world-ending event in Norse myth.

ANSWER: Ragnarökr

(Tossup 10) This politician stated that the United States has the right to enforce legitimate European claims in South America in his corollary to the Monroe Doctrine. The Square Deal was proposed by this man, who aimed to counter predatory wealth by supporting unions. In 1912, this man ran on the Progressive ticket for a third term. The foreign policy "speak softly and carry a big stick" was followed by, For the point, what President who claimed to be as "fit as a bull moose?"

ANSWER: Theodore "Teddy" Roosevelt (prompt on Roosevelt)

(Tossup 11) Pierre Curie names a point, measured in this quantity, at which induced magnetism replaces permanent magnetism. At a "critical point" in this quantity, liquids and gases are indistinguishable, and on a graph of this quantity and pressure, a triple point exists where gases, liquids, and solids coexist. An absolute scale for this quantity was created by Lord Kelvin, who names its SI unit. For the point, name this quantity that is also measured on the Celsius and Fahrenheit scales.

ANSWER: temperature (accept Kelvin before mentioned)

(Tossup 12) Martin Seligman randomly shocked a group of these animals to demonstrate learned helplessness. The 1904 Nobel Prize in Physiology or Medicine was given to a Russian scientist who studied the digestive systems of these animals. A bell was used to make these animals salivate in an early example of classical conditioning. Ivan Pavlov studied, For the point, what animals that were domesticated from wolves by early humans?

ANSWER: dogs (accept Canis lupus familiaris; accept Canis familiaris; prompt on canine)

(Tossup 13) This city was targeted in Operation Meetinghouse, the deadliest air raid in history. In the aftermath of World War II, this city's Akihabara district became a major shopping locale. This city was the main target of the Doolittle Raid which was organized as revenge for the attack on Pearl Harbor. Hirohito announced his country's unconditional surrender from this city's Imperial Palace. For the point, name this capital of Japan.

ANSWER: Tokyo

(Tossup 14) This poet said that "at the flaming forge of life / our fortunes must be wrought" in a poem about "The Village Blacksmith." This poet described the death of Minnehaha in *The Song of Hiawatha*, and wrote "listen my children and you shall hear" in a poem about a heroic "midnight ride." For the point, name this American poet of "Paul Revere's Ride."

ANSWER: Henry Wadsworth Longfellow

(Tossup 15) These astronomical objects can be described only using their angular momentum, electric charge, and mass according to the no-hair theorem. These objects slowly evaporate by giving off trace amounts of thermal radiation, according to a hypothesis by Stephen Hawking. The accretion disks of these objects emit x-rays and are located just outside their event horizons. For the point, name this massive objects whose gravitational pull is so intense that light cannot escape.

ANSWER: black holes

(Tossup 16) The attorney for the plaintiff in this case argued that the Equal Protection Clause had been violated because an inferiority complex had been created. This case was extended to Washington D.C. by incorporating *Bolling v. Sharpe*. This case ruled that a certain action should occur "with all deliberate speed," after which the Little Rock Nine were chosen. For the point, name this court case that overturned *Plessy v. Ferguson* and declared segregation of public schools unconstitutional.

ANSWER: Brown v. Board of Education of Topeka, Kansas

(Tossup 17) This man sculpted the seven-foot-tall *Saint John the Baptist Preaching* to disprove accusations that his work *The Age of Bronze* was cast from a living man. *The Kiss* is part of this sculptor's series based on Dante's *Inferno*, *The Gates of Hell*. For the point, name this French artist who sculpted a nude man leaning over with his chin on his fist in *The Thinker*.

ANSWER: (François) Auguste (René) Rodin

(Tossup 18) The Havasupai American Indians have lived near this landmark for centuries. Tourists visiting this natural wonder often journey toward its South Rim after flying into the nearby city of Flagstaff. This landmark was formed over millions of years of erosion by the largest river in the American Southwest. For the point, name this portion of the Colorado River's pathway found in a namesake national park in Northern Arizona.

ANSWER: Grand Canyon (National Park)

(Tossup 19) In this novel, a child dressed as a ham is attacked on Halloween by Bob Ewell. This novel's narrator witnesses the trial of Tom Robinson and befriends Boo Radley in Maycomb, Alabama, where she lives with her brother, Jem, and father, Atticus. For the point, name this novel by Harper Lee about the childhood of Scout Finch.

ANSWER: To Kill a Mockingbird

(Tossup 20) Amulets called gris-gris [gree-gree] are used in an American variety of this religion, whose officiants are called houngans and mambos. Spirits called loa in this religion include Baron Samedi, and serve the supreme god Bondye. For the point, name this religion, predominant in Haiti, whose practitioners do not actually cast curses with dolls.

ANSWER: Voodoo (accept Vodou)

(Tossup 21) The Siberian Traps may have played a part in one of these events, which caused synapsids to fade. One of these events left behind a layer of iridium in the soil, according to the Alvarez hypothesis. The largest of these events happened at the end of the Permian era, and one of these events likely happened because of the K-T impact at Chicxulub [chick-shoo-loob]. For the point, name these catastrophic events, the last major one of which took place 63 million years ago.

ANSWER: mass extinction events (accept descriptions of the extinction of the dinosaurs throughout)

(Tossup 22) In this war, Jefferson Davis was wounded while leading the 1st Mississippi Rifles in a charge. Robert Stockton supported the Bear Flag Revolt during this war, and Zachary Taylor won the Battle of Buena Vista. Winfield Scott led an invasion at Veracruz and captured the losing side's capital in the Battle of Chapultepec. For the point, name this war launched by the Polk administration and ended by the Treaty of Guadalupe Hidalgo.

ANSWER: Mexican-American War

(Tossup 23) This play's title character bribes Charley's son, Bernard, to share his test answers, and resents his brother Ben's success as a diamond merchant. In this play, Linda repeatedly removes and replaces a rubber hose that her husband plans to use to kill himself. Disappointment with his career and his sons, Biff and Happy, provokes the title suicide of Willy Loman in, for the point, what play by Arthur Miller?

ANSWER: Death of a Salesman

(Tossup 24) This mythical figure lost his battle-prize, Briseis, when Apollo forced Agamemnon to return Chryseis to her people. This warrior avenged the death of Patroclus death by killing Hector and dragging Hector's corpse to desecrate it. When this hero was a child, his mother, Thetis, dipped most of his body into the River Styx, giving him his greatest power. For the point, name this Greek hero of the Trojan War whose only vulnerability was his heel.

ANSWER: Achilles

(Tossup 25) The formula for the sum of the squares from 1 to n has this integer in the denominator. This number also appears in the denominator of the Basel number, whose numerator is pi squared. This number, the third positive triangular number, starts a sequence whose second term is 28 and third term is 496. The smallest perfect number is, For the point, what single-digit number, the product of the two smallest primes?

ANSWER: six

(Tossup 26) A company producing this good was the world's first billion dollar corporation and formed in a 1901 merger organized by Elbert Gary and J.P. Morgan. The Homestead Strike took place at a mill producing this good. Andrew Carnegie used the Bessemer process to mass produce this good. By 1910, Pittsburgh was producing over 30 percent of the nation's supply of, For the point, what alloy of iron and carbon whose strength makes it ideal for construction?

ANSWER: steel (industry)

(Tossup 27) One of these events at Trolldhaugen titles the sixth Lyric Piece by Grieg. The third act of the opera *Lohengrin* begins with a piece often played during these events. The intermezzo between acts 4 and 5 of Mendelssohn's incidental music to *A Midsummer Night's Dream* is a march titled for one of these events. For the point, at what kind of event would one traditionally hear Wagner's "Here Comes the Bride?"

ANSWER: wedding (or marriage ceremony, etc.)

(Tossup 28) After this poem's protagonist is mortally wounded while fighting a dragon, Wiglaf becomes king. This poem's protagonist is insulted by Unferth over his performance in a swimming contest, and is summoned by Hrothgar to defend the mead-hall Heorot, where he rips off a monster's arm. For the point, name this Old English epic in which a Geatish hero defeats the monster Grendel.

ANSWER: Beowulf

(Tossup 29) A part of this process involving reduction can be modeled by the "Z scheme." Another part of this process takes place in the stroma, where RuBisCo catalyzes an early step of the "dark" reactions. During this process, chlorophyll captures energy and stores it as ATP and NADPH. Carbon dioxide is converted into sugar by this process, which creates oxygen as a waste product. For the point, name this process in which plants convert light into energy.

ANSWER: photosynthesis (accept electron transport chain and/or light-dependent reaction(s) before "stroma" and prompt on them afterward; prompt on Calvin cycle and/or light-independent reactions after "stroma" is read)

(Tossup 30) This country contains the industrialized Ruhrgebiet [roor-geb-yet], which was a center of heavy industry during the early and mid 20th century. This country's economic success has been powered by medium-sized firms known as Mittlestand that are clustered heavily in its states of Hessen and Baden-Württemberg. For the point, name this country whose city of Stuttgart is home to Mercedes Benz, and where BMW and Volkswagen also maintain their corporate headquarters.

ANSWER: Germany

Extra Questions

Only read if tiebreaking questions are necessary.

(Tossup 1) In 1851, this city held a Great Exhibition at the Crystal Palace, to showcase its country's technological prowess. A 1666 fire that followed an outbreak of the Bubonic Plague in this city destroyed famous landmarks such as St. Paul's Cathedral. During the Second World War, the Nazi Blitz led residents of this city to take shelter in its Underground. For the point, name this city located on the River Thames, the capital of the United Kingdom.

ANSWER: London

(Tossup 2) An opera by this composer about a disabled black beggar is set in Catfish Row and includes the aria "Summertime." This composer used taxi horns in a work influenced by his trip to France, and opened his most famous work with a clarinet glissando. Many of the lyrics this composer used were written by his brother Ira. For the point, name this American composer of *Porgy and Bess*, *An American in Paris*, and *Rhapsody in Blue*.

ANSWER: George Gershwin

(Tossup 3) This modern country is home to the author of *The Republic of Wine* and *Red Sorghum Clan*. This country's Four Classics include *Water Margin* and *Journey to the West*, in which the monkey king Sun Wukong encounters the Jade Emperor during this country's Tang dynasty. For the point, name this modern country, home to Nobel laureate Mo Yan.

ANSWER: China (accept Zhongguo)

(Tossup 4) This man gained his highest command after Joseph Johnston was wounded at the Battle of Seven Pines. This man led a force of Marines in the suppression of John Brown's revolt at Harpers Ferry. He won the Battle of Chancellorsville against Joseph Hooker, but decisively lost the Battle of Gettysburg. For the point, name this Confederate general who commanded the Army of Northern Virginia.

ANSWER: Robert E. Lee

(Tossup 5) Albert Einstein attempted to integrate this force with the other fundamental forces, but could not. This force is a noncontact force and occurs from curvature of the time-space continuum, as postulated by Einstein's theory of general relativity. An inverse square law calculates the magnitude of this force, using the constant G. For the point, name this attractive force that makes objects fall to the Earth's surface.

ANSWER: gravity