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| High School Academic Pyramid Questions | **FCAT**  **Round 1** |

1. This god's mount was once a diamond-encrusted child created after his father was devoured by insects while praying motionless for centuries. This god's abode is Mount Kailash, and his hair is the source of the Ganges. This god can take the form of Nataraja, the cosmic dancer, and is usually depicted playing the Damura, a two-headed, drum, and wielding the Trishula, a trident. This god saved the world by holding venom in his throat, turning it blue. For 10 points, name this rider of the bull Nandi, a member of the Hindu Trimurti who fills the role of the Destroyer.  
ANSWER: **Shiva**

Name the character from *Their Eyes Were Watching God* who shoots her husband Tea Cake after he develops rabies.  
ANSWER: **Janie** Crawford [or Janie **Crawford**]

2. In a song by this artist, he asks “how them Boyz II Men gon’ win?” In a song by this rapper, he is pulled over for “doing 55 in a 54.” In that song, this artist claims that “if you don’t like my lyrics you can press fast forward” and says “if you’re having girl problems, I feel bad for you, son.” This artist’s song “Takeover” was part of his feud with Nas, and he collaborated with Alicia Keys on “Empire State of Mind.” For 10 points, name this rapper whose Black Album contains “99 Problems.”  
ANSWER: **Jay-Z** [Shawn Corey **Carter**] [or **Hova**]

What is the name of the small flap of cartilage that prevents food from getting into the larynx during swallowing?  
ANSWER: **epiglottis**

3. These organisms produce internal buds called gemmules during reproduction, and they expel waste through the osculum. These animals have a middle section called a mesohyl surrounded by a skeleton-like structure supported by spicules. These organisms allow water to continually flow through pores and channels in their bodies. For 10 points, name these organisms found in phylum Porifera.  
ANSWER: **sponge**s [or **Porifera** until it is read]

What frontiersman, who rounded up 8,000 Navajos on the "Long Walk," is the namesake of Nevada's capital?  
ANSWER: Kit **Carson** [or Christopher Houston **Carson**]

4. This poet developed the rhyme royal stanza for his poem Troilus and Criseyde. He also wrote about the tournament held to decide between Palamon and Arcite which one would marry Theseus’s daughter Emelye. That story of his is narrated by the Knight, who accompanies the Pardoner and the Wife of Bath on a pilgrimage to the shrine of Thomas Becket. For 10 points, name this medieval author of The Canterbury Tales.  
ANSWER: Geoffrey **Chaucer**

What poetic form, used by Dylan Thomas in “Do Not Go Gentle Into That Good Night,” consists of nineteen lines that include two repeating rhymes and two refrains?  
ANSWER: **villanelle**

5. This river’s delta contains a dense jungle called the Sundarbans. This river forms from the confluence of the Alaknanda and Bhagirathi Rivers in Uttarakhand. It is called the Padma River when it crosses into Bangladesh, and it eventually flows into the Bay of Bengal. This waterway has become polluted from people frequently bathing in it and throwing their loved ones’ ashes into it. For 10 points, name this holy river of Hinduism.  
ANSWER: **Ganges** River

This is a 20-second calculation question. What are the solutions to the equation “the absolute value of quantity x minus 5 end quantity equals 3?”  
ANSWER: x = **8** and x = **2**

6. The change in equilibrium constant with temperature depends only on the change in this quantity for the reaction in the van't Hoff equation. The change in this quantity can be calculated by subtracting the bond energy of the products from that of the reactants according to Hess' Law. At constant pressure, its change equals the heat added to the system, such as in a Styrofoam coffee-cup calorimeter. For 10 points, name this thermodynamic quantity symbolized H.  
ANSWER: **enthalpy** [or **H** until it is read]

This is a 20-second calculation question. What is the midpoint of the line segment between the points (3, -2) and (-6, 4)?  
ANSWER: **(-1.5, 1)** [or **(-3/2, 1)**]

7. This company operates a social network called MHBuddy and returned to profitability under CEO Ahmad Jauhari Yahya. The Donbass People's Militia were accused of using a Buk surface-to-air missile system to destroy one of this company's planes in July 2014. For 10 points, name this airline which, in March 2014, suffered the disappearance of a plane headed to Beijing from Kuala Lumpur.  
ANSWER: **Malaysia** **Airlines**

What J.S. Bach composition for harpsichord features a set of thirty variations on an aria?  
ANSWER: **Goldberg Variation**s [or **Goldberg-Variationen**]

8. During this war, an insane king killed some of his attendants, an incident recorded in Jean Froissart's Chronicle of this war. This war was interrupted by the Treaty of Troyes. The Jacquerie rebellion occurred during this war after John the Good was captured at the Battle of Poitiers. Joan of Arc helped lift the Siege of Orleans in this war, which also included Henry V's victory at the Battle of Agincourt. For 10 points, name this war between France and England that lasted approximately a century.  
ANSWER: **Hundred** **Years**' War

What protest song, most famously sung by Edwin Starr, asks what the title action “is good for,” answering with “Absolutely nothing!”  
ANSWER: “**War**”

9. For certain situations, a proportionality coefficiant associated with this quantity must be at least two-sevenths times the tangent of theta to avoid slipping. This phenomenon is described by Amontons's laws, and its absence yields superlubricity. Its namesake coefficient, mu, is multplied by the normal force to yield this quantity. For 10 points, name this force which opposes sliding motion.  
ANSWER: **friction**al force

In August 2014, British Airways suspended service in Liberia and Sierra Leone out of concern regarding an outbreak of what deadly virus?  
ANSWER: **Ebola** virus disease [or **Ebola** hemorrhagic fever]

10. While a senator, this leader was offered command of an army by Narciso Lopez to liberate Cuba. This man was assigned to escort Black Hawk to prison. After Joseph Johnston was wounded, he appointed Robert E. Lee to command the Army of Northern Virginia. His Vice President delivered the Cornerstone speech, and he was imprisoned in Fortress Monroe after he was captured in 1865. For 10 points, name this only president of the Confederate States of America.  
ANSWER: Jefferson **Davis** [Jefferson Finis **Davis**]

“How do I love thee? Let me count the ways” begins the most famous poem in what collection by Elizabeth Barrett Browning, named after her husband’s pet name for her?  
ANSWER: ***Sonnets from the Portuguese***

11. In a story by this author, Julian’s racist mother collapses after being struck by a black woman for offering a penny to the woman’s child. In addition to writing “Everything That Rises Must Converge,” she wrote about a criminal called “The Misfit” murdering the Grandmother and her family after their car crashes. For 10 points, name this Southern author of “A Good Man Is Hard to Find.”  
ANSWER: Flannery **O’Connor**

At what World War I Allied victory did six thousand French soldiers arrive in taxicabs as reinforcements, putting an end to the Schlieffen Plan?  
ANSWER: First Battle of the **Marne** [do not accept "Second Battle of the Marne"]

12. Edmund Neupert premiered this composer’s only completed piano concerto, which was in A minor. He collected 66 short piano compositions in his Lyric Pieces. Another of his compositions depicts in a sunrise in its section “Morning Mood.” This composer set music to a Henrik Ibsen play that included the song “In the Hall of the Mountain King.” For 10 points, name this Norwegian composer of the Peer Gynt suite.  
ANSWER: Edvard Hagerup **Grieg**

What woman is identified as the first wife of Adam, replaced by Eve when she refused to bow down to him?  
ANSWER: **Lilith**

13. Francois Salvolini wrote papers on this object that were plagiarized from its most noteworthy scholar. Antoine-Jean Letronne assisted in the understanding of one part of this object, helping Jean-Francois Champollion. It contains a decree by Ptolemy V in three separate languages, including Demotic and Ancient Greek. For 10 points, name this object discovered by Napoleon’s soldiers, which led to a breakthrough in the translation of hieroglyphs.  
ANSWER: **Rosetta Stone**

Which lightest halogen is bonded to carbon and chlorine in Freon?  
ANSWER: **fluorine** [or **F**]

14. This operation can be performed in any order according to Fubini's Theorem. A method of approximation for it is Simpson's Rule, and another method involves calculating the areas of multiple trapezoids. This operation can also be calculated "by parts." When this operation is given bounds, it is called "definite." Approximated using Riemann sums, for 10 points, identify this calculus operation, the opposite of a derivative.  
ANSWER: **integral** [or word forms; prompt on **anti-derivative**]

Name the English translation for the food called “fromage” in French and “queso” in Spanish. ANSWER: **cheese**

15. At the beginning of a play by this writer, a city watchman complains about having been idle for a year. Kratos and Bia assist in chaining the title character to a rock in another play by this author. This man wrote a trilogy about the son of Agamemnon avenging his murder at the hands of Clytemnestra, including the plays The Furies and The Libation Bearers. For 10 points, name this Greek tragedian of Prometheus Bound and the Oresteia.  
ANSWER: **Aeschylus**

This is a 30-second calculation question. When drawing three cards from a standard deck of 52 cards without replacement, what is the probability that all three of the cards are the same suit?  
ANSWER: **22/425** [or **132/2550**]

16. This author created the fictional poet John Shade, whose 999-line poem titles a novel consisting mostly of commentary by Charles Kinbote. He also created the playwright and pornographer Clare Quilty, who takes away the title character of another novel. That novel of his is narrated by Humbert Humbert, who is obsessed with young girls he calls “nymphets.” For 10 points, name this Russian-American author of *Pale Fire* and *Lolita*.  
ANSWER: Vladimir **Nabokov**

This is a 30-second calculation question. Two sides of a non-right triangle have lengths 4 and 5 units respectively. If the angle between them is 60 degrees, what is the length of the third side?  
ANSWER: square **root** of **21** [or **radical 21**]

17. This organelle uses the TIC and TOC translocases for protein importation. In one portion of this organelle, cytochrome b6f transfers electrons between plastoquinol and plastocyanin. NADP is reduced to NADPH in a fluid called stroma in this organelle. In this organelle, lamellae link together grana, which are composed of several thylakoids. This plant organelle has a green pigment. For 10 points, name this plant organelle which is the site of photosynthesis.  
ANSWER: **chroloplast**

What is the largest known cave system in the world, located in central Kentucky?  
ANSWER: **Mammoth** Cave

18. This leader was supported in one battle by Gatling Guns commanded by Lt. John H. Parker, and he served under Colonel Leonard Wood before taking command of his unit. This leader led a force of volunteers, army regulars, and Buffalo Soldiers in a charge that captured Kettle Hill and San Juan Hill during the Spanish-American War. For 10 points, name this leader of the “Rough Riders,” who also became President of the United States upon the death of William McKinley.  
ANSWER: **T**heodore **Roosevelt** [or **T**eddy **Roosevelt**; prompt on **Roosevelt**]

What novella features the Polish teenager Tadzio, who attracts the attention of Gustav von Aschenbach in the title Italian city and was written by Thomas Mann?  
ANSWER: ***Death in Venice*** [or ***Der Tod in Venedig***]

19. Apollo killed some of these creatures in revenge for the death of his son Asclepius. After they were freed from Tartarus, three of these beings named Brontes, Arges, and Steropes created the thunderbolts of Zeus. Odysseus called himself "nobody" in order to trick and blind one of these creatures, who was a son of Poseidon named Polyphemus. For 10 points, name this race of one-eyed beings in Greek mythology.  
ANSWER: **cyclops** [or **cyclopes**]

What Secretary of State negotiated the purchase of Alaska, an action which at the time was dubbed this man's "Folly"?  
ANSWER: William Henry **Seward**

20. This character's lover, Silver Fox, was murdered by one of his rivals. In his first published appearance, he is a Canadian agent who confronts the Incredible Hulk. This man's arch-enemy is Victor Creed, the savage murderer known as Sabretooth. During experiments by the secretive Weapon X program, this man was given a skeleton of unbreakable adamantium. For 10 points, name this member of the X-Men who has a healing factor and retractable claws.  
ANSWER: **Wolverine** [or **Logan**; or **James**; or **Howlett**; or "**Weapon X**" until it is read]

Name the effect in which crystals, such as quartz, acquire an electric charge when subject to stress.  
ANSWER: **piezoelectricity** [or **piezoelectric** effect]

21. For an infinitely thin sphere, this quantity is four pi times the radius times the electric constant. This quantity, whose inverse is elastance, is given by the product of the permeability of free space and area, all over distance, for a certain device. Adding dielectrics to devices made of parallel plates increases this quantity. For 10 points, name this measure of stored electric charge, measured in farads.  
ANSWER: **capacitance** [prompt on **C**]

Diego Rivera's mural *Man at the Crossroads* stirred up controversy for depicting what Russian leader?  
ANSWER: Vladimir **Lenin** [or Vladimir Ilyich **Lenin**; or Vladimir Ilyich **Ulyanov**]

22. The artist of this painting created a similar version that was set over the Rhone. A church steeple is in the lower half of this painting, while its left half depicts a burning cypress tree. Depicting the village of Saint-Remy from the artist's asylum, this painting features eleven stars and a crescent moon in a blue swirling sky. For 10 points, name this 1889 painting by Vincent van Gogh.  
ANSWER: ***Starry Night*** [or De ***Sterrennacht***]

Name the people who left France after Louis XIV issued the Edict of Fontainebleau, which revoked many of the rights Henry IV had given them in the Edict of Nantes.  
ANSWER: **Huguenot**s [or French **Protestant**s]

23. This novel’s protagonist is referred to as “Prince Charming” by the actress Sybil Vane, who loses her talent for playing Juliet after falling in love with him. The title artwork of this novel is created by Basil Hallward, whom the title character kills after showing him how grotesque it has become. For 10 points, name this novel by Oscar Wilde about a man who remains young as his portrait ages.  
ANSWER: *The* ***Picture of Dorian Gray***[do not accept “The Portrait of Dorian Gray”]

What Colorado city was the site of a mass shooting that killed twelve during a midnight screening of *The Dark Knight Rises* in July 2012?  
ANSWER: **Aurora**, Colorado

24. The Kingdom of Hejaz split from this empire after the Treaties of Sevres and Lausanne. Anzac Day commemorated an ill-fated campaign in this empire that sought to secure the Dardanelles. This empire, which was labeled "the sick man of Europe," perpetrated the Armenian genocide and was the site of the Gallipoli campaign. For 10 points, name this empire that became modern-day Turkey.  
ANSWER: **Ottoman** Empire

What hormone, produced in the adrenal glands, is responsible for a “fight or flight” mechanism in humans and is the namesake of “pens” used by those with allergies?  
ANSWER: **epinephrine** [or **adrenaline**]

25. Okun's Law states that the cyclical form of this phenomenon decreases as GDP increases, and the Phillips Curve shows an inverse relationship between it and inflation. The natural rate of this phenomenon combines its frictional and structural forms, and mall Santas suffer its seasonal type. The official reported rate of this phenomenon does not include discouraged workers. For 10 points, name this economic phenomenon which results from people being unable to find jobs.  
ANSWER: **unemployment**

This is a 20-second calculation question. What is the minimum value of the function "f of x equals 3 plus 2 times the sine of x?"  
ANSWER: **1**

26. This country is home to the Minaret of Jam, which was allegedly part of the lost city of Turquoise Mountain. In 2001, two statues of the Buddha were bombed in this country's Bamiyan Valley. This country was earlier the site of a civilian massacre at Mazar-i-Sharif. This country, whose main ethnic group is the Pashtun, is home to Bagram Air Base. The Durand Line runs along this country's border with Pakistan. For 10 points, name this war-torn country overrun by the Taliban.  
ANSWER: **Afghanistan** [Islamic Republic of **Afghanistan**]

This is a 20-second calculation question. When rolling two standard six-sided dice, what is the probability that the sum of the numbers shown on the top faces of the dice is exactly 3?  
ANSWER: **1/18** [or **2/36**]

27. This leader’s tomb was renovated at the expense of Emperor Wilhelm II, who donated a new sarcophagus for this man. Patriarch Heraclius raised funds to ransom several thousand captives that had been taken by this ruler. This leader captured the True Cross at the Battle of Hattin, and he signed a treaty guaranteeing Christian access to Jerusalem with Richard the Lionheart during the Third Crusade. For 10 points, name this first Ayyubid Sultan of Egypt.  
ANSWER: **Saladin** [**Salah ad-Din** Yusuf ibn Ayyub]

The verb in the Latin phrase "Gaudeamus igitur" is in what non-indicative grammatical mood, which can be used to express wishes?  
ANSWER: **subjunctive**

28. The proposed TiME mission would float on this body. This body is locked in orbital resonance with Hyperion, and its “Xanadu” region has a very high albedo. This object’s atmosphere is primarily nitrogen and extremely dense, but includes many methane clouds, and it is the location of the cryovolcano Sotra Facula. This object was studied by the Huygens lander, named for the astronomer who discovered it. For 10 points, name this largest moon of Saturn.  
ANSWER: **Titan**

What Midwestern city was described as a "Stacker of Wheat" with "big shoulders" in a poem by Carl Sandburg?  
ANSWER: "**Chicago**"

29. This philosophy advocates embracing the natural order through a doctrine called the Rectification of Names. This tradition was challenged by Mozi and championed by Mencius, and venerates li, or ritual, and a fundamental goodness called ren. Early adherents of this philosophy collected its founder's thought into the Analects. For 10 points, name this philosophical school founded by a namesake Zhou Dynasty thinker and heavily practiced throughout imperial China.  
ANSWER: **Confucian**ism [or any answer mentioning **Confucius**; or **Mo**ism until “Mozi”]

What Athenian statesman was succeeded by the tyrant Peisistratus and repealed much of Draco's harsh law code?  
ANSWER: **Solon**

30. This musician drew from Stockhausen and funk for his 1972 album On The Corner. He performed a Gil Evans arrangement of Joaquin Rodrigo’s *Concierto de Aranjuez* for jazz ensemble in *Sketches of Spain*, and his “first great quintet” performed “So What” and “Freddie Freeloader” on an album that epitomized cool jazz. For 10 points, name this trumpeter and bandleader who recorded *Kind of Blue*.  
ANSWER: Miles **Davis**

What name is given to the line that all points of a parabola are the same distance from as they are from the focus?  
ANSWER: **directrix**

31. This man printed the Greek New Testament edition used as the basis for the King James and Luther bibles, the *Textus Receptus*. This theologian wrote about St. Peter denying a pope entry into heaven in *Julius Excluded* and wrote his best known work in the house of his friend, Thomas More. That work uses the title foolish character to satirize the Catholic Church. For 10 points, name this author of *The Praise of Folly*, a Dutch humanist.  
ANSWER: **Erasmus** of Rotterdam [or Desiderius **Erasmus** Roterdamus]

Name the mythical sculptor from Cyprus whose offerings to Aphrodite made his statue become alive. ANSWER: **Pygmalion**

32. In DNA, C-G base pairs form three of these interactions, rather than the two formed in A-T pairs. Protein secondary structure, such as alpha helices, consists of these interactions within a peptide backbone. These bonds form between ethanol and water in solution. These strong dipole-dipole forces occur because nitrogen, oxygen, and fluorine have high electronegativities. For 10 points, name these bonds always involve the lightest gas on the Periodic Table.  
ANSWER: **hydrogen** bonds [or **hydrogen** bonding]

What city gets water from the Lake Biwa Canal and is the namesake of a 1997 “protocol” concerning the emission of greenhouse gases.  
ANSWER: **Kyoto**

33. In a poem by this author, the speaker determines the power that guides the title bird “will lead my steps aright” after asking it “whither…dost thou pursue thy solitary way?” In another poem, he instructs one to “approach thy grave, like one who wraps the drapery of his couch about him, and lies down to pleasant dreams.” For 10 points, name this American poet of “To a Waterfowl” and “Thanatopsis.”  
ANSWER: William Cullen **Bryant**

In what Nadine Gordimer novel does the title black servant aid the Smales family as they free Johannesburg?  
ANSWER: ***July’s People***

34. A disaster involving one of these objects was investigated by the Rogers Commission and was caused by a failed O-ring. Another disaster involving one of these objects occurred when foam from its external fuel tank damaged its wing, causing it to break up upon reentry. One of these vehicles deployed the Hubble Space Telescope in 1990. For 10 points, name these spacecraft operated by NASA until 2011 which had names like Atlantis, Columbia, and Challenger.  
ANSWER: **Space Shuttle**

Along with solicitor, what word in Britain refers to an attorney, in this case, one who is qualified to argue cases in courts?  
ANSWER: **barrister**

35. The difficult maintenance of a glass roof led to the demolition of this location's Ambassador's Staircase. The tapestry manufacture Gobelins was nationalized as part of the effort to create this location, which was fed by hydraulic works at Marly. Lully's Persee premiered at this location's small theater. The Salons of War and Peace are found in this masterpiece of Jules Hardouin-Mansart, who worked with Andre Le Notre on its massive gardens and fountains and Charles Le Brun on its Hall of Mirrors. For 10 points, name this French palace built for Louis XIV.  
ANSWER: **Versailles**

This is a 30-second calculation question. What are all of the solutions to the equation "x cubed minus 2 x squared minus 9 x plus 18 equals 0?"  
ANSWER: x = **3**, x = **-3**, and x = **2**

36. The protagonist of this novel hews a head from a corpse so he can fit it into the household furnace. The Communist lawyer Boris Max unsuccessfully defends the main character of this novel. This novel’s protagonist accidentally smothers Mary Dalton, whose white family he works for as a chauffeur. For 10 points, name this novel about Bigger Thomas written by Richard Wright.  
ANSWER: ***Native******Son***

This is a 30-second calculation question. If the three angles of a triangle are represented as x + 30, 3x, and 4x - 10, then in degrees, what is the measure of the largest angle?  
ANSWER: **70** degrees

37. Giovanni Donato’s depiction of the Crucifixion lies across from this painting in the Santa Maria delle Grazie. In this painting, a cup holding salt is tipped over by a man who clutches a bag in his right hand. The apostle John is shown with long hair in this painting, to the left of its central figure, whose palms are open. For 10 points, name this Leonardo da Vinci painting that depicts Christ’s final meal.  
ANSWER: *The* ***Last******Supper*** [or *Il* ***Cenacolo***; or *L’****Ultima* *Cena***]

What man advocated a policy of détente while serving as Secretary of State under Nixon and Ford?  
ANSWER: Henry **Kissinger**

38. An antagonist of this compound is prolactin. This compound's synthesis involves the hydroxylation of tyrosine, and it acts on the mesolimbic and mesocortical pathways in the central nervous system. This neurotransmitter is primarily produced in the substantia nigra, and it is a precursor to norepinephrine. A deficiency in this neurotransmitter's action is associated with Parkinson's disease. For 10 points, name this neurotransmitter associated with reward-seeking behavior, and whose precursor is L-dopa.  
ANSWER: **dopamine**

What Daphne du Maurier novel, which opens with the line "Last night I dreamt I went to Manderley again," features the cruel housekeeper Mrs. Danvers?  
ANSWER: ***Rebecca***

39. This state was the site of the Reconstruction-era Colfax Massacre. During the Civil War, this state's largest city was occupied by the widely-hated Benjamin Butler. This state's segregation of train cars was upheld in Plessy v. Ferguson. In a battle in this state, the pirate Jean Lafitte assisted Andrew Jackson in a decisive American victory during the War of 1812. For 10 points, name this southeastern state home to New Orleans.  
ANSWER: **Louisiana**

What college football team did Mike Evans and Johnny Manziel play for in the 2013 season?  
ANSWER: **Texas A&M** University [or **TAMU**; prompt on **Aggies**]

40. The main decay mode of neutral pions is into two of these particles. These particles collide with electrons to produce Compton scattering. These gauge bosons can be bombarded at a sheet of metal, causing the emissions of electrons, in an effect explained by Einstein. For 10 points, name these particles which can exhibit wave properties, and which are the quanta of light.  
ANSWER: **photon**s

The Large Hadron Collider managed to confirm the existence of what elementary particle referred to as the "God particle"?  
ANSWER: **Higgs boson**

*End of regulation round*.

Extra. This author speculated about the fate of Shakespeare’s hypothetical sister Judith in a landmark feminist essay entitled A Room of One’s Own. She wrote about the suicide of Septimus Smith in a novel in which the title character Clarissa hosts a party. She created the Ramsay family in a novel that ends with their visit to the title structure. For 10 points, name this modernist who wrote Mrs. Dalloway and To the Lighthouse.  
ANSWER: Virginia **Woolf**

Extra. This man helped his future wife, Katharina von Bora, escape from a nunnery in a barrell. This person condemned Thomas Munzer's peasant army as a "Murderous and Thieving Horde." This man was kidnapped and taken to Wartburg castle on orders of Frederick III of Saxony. He burned the papal bull Exsurge Domine and was questioned by Johann Eck at the Diet of Worms. For 10 points, name this man who posted his 95 Theses at the Wittenberg cathedral, thus beginning the Protestant reformation.  
ANSWER: Martin **Luther**

Extra. After discovering a fact about this number, Hippasus was allegedly murdered by followers of Pythagoras. If a sphere is circumscribed about an octahedron with sides of length 1, the sphere has this diameter. This value is the length of the diagonal of a unit square, and the hypotenuse of a right triangle with legs of length 1. For 10 points, identify this irrational number, equal to about 1.414.  
ANSWER: the square **root** of **2**

Extra. A park in this state employs vehicles called Red Jammers, which cross the narrow Going-to-the-Sun Road. The Jefferson, Madison and Gallatin Rivers merge to form the Missouri in this state, whose Flathead Lake is a remnant of the prehistoric Lake Missoula. This state’s border with the province of Alberta is the site of Glacier National Park. For 10 points, name this state whose cities include Billings and Helena.  
ANSWER: **Montana**

Extra. At the 2009 U.S. Open semifinals, this player retrieved a lob from Novak Djokovic with an in-between-the-legs tweener, which brought him match point. He defeated Pete Sampras in 2001 in a five-set thriller in the fourth round of Wimbledon, and won his first Grand Slam against Mark Philippoussis in 2003. This player has a long rivalry with another man nicknamed the “King of Clay,” Rafael Nadal. For 10 points, name this Swiss tennis player, a 17-time Grand Slam champion.  
ANSWER: Roger **Federer**

Extra. What English author of *The New Atlantis* is credited with developing the scientific method? ANSWER: Francis **Bacon**

Extra. A "tiny" Great Pyramid is created as a square pyramid with base side length 30 inches and height 19 inches. What is the volume of this pyramid?  
ANSWER: **5700** cubic inches

Extra. Name this Stravinsky ballet in which King Kashchei is killed by Prince Ivan with the help of the title avian creature.  
ANSWER: *The* ***Firebird***

Extra. What substance was licked by the primeval Norse cow Audhumbla to liberate Ymir?  
ANSWER: **ice** [do not accept “water”]