



1. When FGF is absent and BMP4 is inhibited, the precursors to this organ begin development. A layer of endothelial (en-doh-THEE-lee-uhl) cells in this organ form a "barrier" with the blood. This organ forms after a plate and groove become a crest, then a tube. One cell type in this organ stops production after birth, in contrast with the glial cells. The corpus callosum acts as a bridge between different parts of this organ. This organ and the spinal cord form the central nervous system. For 10 points, name this organ found inside the cranium.

ANSWER: **brain**

020-12-55-06101

2. This President sent Stephen Decatur to end tributes to the Barbary States. With Jefferson, this man denounced the Alien and Sedition Acts in the Virginia and Kentucky Resolutions. He wrote the Federalist Papers with Jay and Hamilton, and wrote the Bill of Rights and drafted most of the rest of the Constitution. This man's wife Dolley allegedly grabbed a portrait of Washington as the White House burned. For 10 points, name this President during the War of 1812 who succeeded Thomas Jefferson.

ANSWER: James **Madison**

015-12-55-06102

3. During this process, the protein FtsZ ("F T S Z") forms a ring like structure in the center of the cell. FtsZ is the foundation of the septal ring which mediates cell division in this process and assembles the septum. The last step of this process sees the completion of the cross-wall. Before this process occurs, the cell must copy its genetic material and segregate it at opposite ends of the cell. For 10 points, name this form of asexual reproduction by which prokaryotes split to create two identical copies of themselves.

ANSWER: **binary fission**

066-12-55-06103

4. This President suspended his Secretary of War after it was revealed that said Secretary withheld a petition urging this man to commute Mary Surratt's death sentence to life imprisonment. This man was the only Senator of a state that seceded not to resign his seat at the start of the Civil War. This man was impeached for removing Edward Stanton as Secretary of War and violating the Tenure of Office Act. For 10 points, name this man who became President after Lincoln's assassination.

ANSWER: Andrew **Johnson**

066-12-55-06104

5. Replacing the central carbon in acetone with this element produces DMSO. A compound containing this element is transformed into the elemental form via the Claus process. It is found in the amino acids cysteine (SIH-steen) and methionine (meth-IY-oh-neen). One group of archaeobacteria require compounds from this element produced from vents in the ocean. An odor of rotting eggs is produced from a compound with two hydrogens and this element. For 10 points, name this element found just below oxygen, with atomic number 16.

ANSWER: **sulfur** [prompt on **S**]

020-12-55-06105

6. John Kendrick introduced the resolution that led to the investigation of this scandal. That investigation was led by Thomas Walsh, who explored the payments leading to this scandal that were made by Edward L. Doheny and Harry F. Sinclair. This event resulted in the resignation of Navy Secretary Edwin Denby and its chief orchestrator, Albert Fall. For 10 points, name this scandal in which federal oil reserves were leased out to private companies during the Harding administration.

ANSWER: **Teapot Dome** Scandal

023-12-55-06106

7. The protagonist of one of this author's novels ends up making love to Klamm's former mistress Frieda. In another novel by this writer, the protagonist's sexual advances are rebuffed by a fellow boarder named Fraulein Burstner. In that novel, the court orders the execution of a conscientious bank official named Joseph K. This author of *The Castle* also wrote a story about Gregor Samsa, who undergoes the title transformation into an insect. For 10 points, name this author of *The Trial* and "The Metamorphosis."

ANSWER: Franz **Kafka**

130-12-55-06107

8. The carbonate of this element is known as smithsonite, although its most common ore is sphalerite. Anti-dandruff shampoos typically contain a complex of this element and pyridithione (pie-RITH-ee-own). This element forms "gag-knuckle" and "treble-clef" structures, and a structural motif coordinating its ions is known as this element's "finger" motif. For 10 points, identify this element from the periodic table with atomic number 30 and symbol Zn.

ANSWER: **zinc**

126-12-55-06108

9. In one poem, he declared, "The armies of those I love engirth me and I engirth them." This poet wrote, "great or small, you furnish your parts toward the soul" in a poem beginning, "Flood-tide below me! I see you face to face!" This poet of "I Sing the Body Electric" and "Crossing Brooklyn Ferry" wrote, "I sound my barbaric yawp over the roofs of the world" in a poem asserting, "I celebrate myself, and sing myself." For 10 points, name this American poet of "Song of Myself," part of his collection *Leaves of Grass*.

ANSWER: Walter **Whitman**

014-12-55-06109

10. Euler's ("oilers") formula can be used to represent complex numbers in this system. Using the semi-latus rectum and the eccentricity as constants, conic sections can be represented directly in this system. One coordinate in this system can be found by taking the square root of the sum of squares of the x and y terms. Lemniscates (LEM-niss-kates) and cardioids (CAR-dee-oydz) can be represented in this system, which uses r and theta as variables. For 10 points, name this 2D coordinate system where each point is determined by a distance and angle.

ANSWER: **polar** coordinates

020-12-55-06110

11. This author created the McCaslin family, whose tenant farmer Lucas Beauchamp is falsely accused of murder in his novel *Intruder in the Dust*. One character created by this author leaves his watch in Shreve's desk before committing suicide by jumping into the Charles River. In another novel, Gillespie's barn is set on fire by Darl in an attempt to incinerate the coffin and corpse of Addie Bundren. For 10 points, name this American novelist of *The Sound and the Fury* and *As I Lay Dying*.

ANSWER: William Cuthbert **Faulkner**

014-12-55-06111

12. In one rite from this religion, a priest waves a stick with white pieces of paper attached over a believer to purify him. One temple sacred in this religion is torn down and rebuilt every twenty years. This religion's "State" variety gave supreme power to the emperor, who was a descendant of the sun god. Red gateways called *torii* (TOR-ee) serve as entrances into this religion's shrines. For 10 points, name this Japanese religion that worships *kami* (KAH-mee).

ANSWER: **Shintoism**

080-12-55-06112

13. This lake is linked to another lake to its south by the Soo Locks. Twenty-two islands in this lake form the Apostle Islands. This lake is also the location of a national park on Isle Royale. Ports on this lake include Thunder Bay in Ontario and Marquette in Michigan. Based on surface area, this lake is the largest freshwater lake in the world. For 10 points, name this lake that borders a namesake town in Wisconsin and Duluth, Minnesota, and is the largest of the Great Lakes.

ANSWER: Lake **Superior**

023-12-55-06113

14. The main character of one short story by this man first catches his eyes on a "chunky kid, with a good tan" in a "plaid green two-piece" as he rings up a box of HiHo crackers. This author of "A&P" also wrote about a man who visits his high school basketball coach Marty Tothoro. In another work by this man, Janice drowns Rebecca June after being left for Ruth. That novel features his recurring protagonist Harry Angstrom. For 10 points, name this American novelist of *Rabbit, Run*.

ANSWER: John Hoyer **Updike**

149-12-55-06114

15. The Sajur (SAH-jurr) and Khebur (KAY-burr) are two tributaries of this river, whose course was altered by the construction of the Hindiya (hin-DEE-yuh) Barrage during the early twentieth century. Formed from the confluence of the Murat Su and Kara Su rivers in Turkey, it flows past the city of Kufa in Iraq before forming the Shatt-al-Arab (SHOT ahl-ah-ROB) with an eastern neighbor. This river loosely defines the western edge of the Fertile Crescent and Mesopotamia. For 10 points, name this Asian river that merges with the Tigris.

ANSWER: **Euphrates** River

040-12-55-06115



1A. This is a 10-second calculation question. If $x^2 - 4a = 28$, and $a = 2$, what are the possible values of x ?

ANSWER: **6 and -6** [do not accept "6" or "-6" on their own]

1B. This is a 10-second calculation question. If a vase holds three red and 2 blue balls, what is the chance of pulling out first a red and then a blue, with no replacement?

ANSWER: **30%** [or **0.3**; or **3/10**]

2A. Identify the Secretary of Health and Human Services who, in 2011, overruled an FDA decision regarding the availability of emergency contraception without a prescription.

ANSWER: Kathleen **Sebelius**

2B. What type of computer can run Simon's algorithm and can quickly find prime factors using Shor's algorithm?

ANSWER: **quantum** computer

3A. What form of photosynthesis uses PEP carboxylase (car-BOX-ih-lase) to uptake carbon dioxide and utilizes the Calvin cycle only in bundle sheath cells?

ANSWER: **C4** photosynthesis

3B. What Lorraine Hansberry play about the Youngers takes its title from the poem "Harlem"?

ANSWER: A ***Raisin in the Sun***

4A. Name these longitudinally-propagating waves that are the first to be produced during earthquakes and are refracted by the outer core.

ANSWER: **P**-waves [or **primary** waves or **pressure** waves]

4B. What is the number of different tones in Mandarin, also the number of verb conjugations in Latin?

ANSWER: **four**

5A. This is a 20-second calculation question. In simplest form, what is the mean of the data set {5, 14, 6, 1035, 2, 8}?

ANSWER: **178 1/3** [or **535/3** or **178.333** repeating or **178.3 repeating**]

5B. This is a 20-second calculation question. What is the volume of a square pyramid with base length 3 units and slant height 2.5 units?

ANSWER: **6** cubic units

6A. What is the term for an ion that has a positive charge, as opposed to a negatively charged anion (AN-iy-uhn)?

ANSWER: **cation** (CAT-eye-on)

6B. In a Borges story, Pierre Menard recreates what novel by Miguel Cervantes about a delusional Spaniard?

ANSWER: *The Ingenious Gentleman **Don Quixote*** (kee-HOE-tee) of *La Mancha* [or *El Ingenioso Hidalgo **Don Quijote** de la Mancha*]

7A. What Italian composer composed *Rigoletto* and *Aida*?

ANSWER: Giuseppe **Verdi**

7B. What AMC show stars Andrew Lincoln as Rick Grimes, a man who leads a band of survivors in the midst of a zombie apocalypse?

ANSWER: *The Walking Dead*

8A. Which Georgia city on the Gulf Coast was the endpoint of Sherman's march to the sea?

ANSWER: **Savannah**

8B. The "Hallelujah" chorus is part of what composer's *Messiah* oratorio?

ANSWER: George Frideric **Handel** [or Georg Friedrich **Handel**]

9A. This is a 30-second calculation question. Given the three equations $x + y + z = 4$; $x + 2y + 2z = -2$; and $2x - y + z = 6$; what are x , y , and z ?

ANSWER: **$x = 10$, $y = 4$, $z = -10$** [do not accept or prompt on partial answers]

9B. This is a 30-second calculation question. Find all values theta on the interval theta is between 180 and 540 degrees, inclusive, such that sine of two theta equals -1.

ANSWER: **{315, 495}** [or theta equals **315 and 495** degrees]

10A. Cesare Beccaria (beck-ARR-ee-uh) founded the academic study of what phenomenon, which "strain theory" also tries to explain the origin of?

ANSWER: **crime** [or **criminal behavior**; or phrases that describe **breaking the law** in some way]

10B. What play by Luigi Pirandello features characters such as the Father, the Director, and the Stepdaughter?

ANSWER: *Six Characters in Search of an Author* [or *Sei Personaggi in Cerca d'Autore*]



1. The Rydberg (RID-berg) constant is inversely proportional to this man's namesake constant. This man was the first prominent physicist to endorse Einstein's theory of special relativity. He incidentally solved the ultraviolet catastrophe by postulating that the emission of radiation from a blackbody was quantized. When this man's namesake constant is divided by 2π it is called "reduced" and drawn with a bar through it. For 10 points, name this physicist whose namesake constant is equal to 6.626 times 10 to the -34.

ANSWER: Max Karl Ernst Ludwig **Planck**

066-12-55-06117

2. A blue hat with gold embroidering lies in the foreground of this painting. One figure lies down in this painting bottomless, murdered in his bed and dragged through the street. The title figure is flanked by a top-hat and bow-tie wearing man and a boy carrying a satchel with a pistol in each hand. The central figure of this painting wears a Phrygian (FRIG-ee-an) cap, is barebreasted, and waves the tricolor flag. For 10 points, name this painting commemorating the July Revolution in France, created by Eugene Delacroix.

ANSWER: ***Liberty Leading the People*** [or *La Liberté guidant le peuple*]

020-12-55-06118

3. This quantity can be found by using the stretch rule and the perpendicular axis theorem. If one knows this quantity for an object, it can be found for another object with an axis parallel to that of the known object by the parallel axis theorem. In general it is found by integrating from 0 to the mass over the radius squared times a differential mass. Thus, for a solid sphere, it is equal to two-fifths times mass times the radius squared. For 10 points, name this rotational analogue of mass.

ANSWER: **moment of inertia**

066-12-55-06119

4. In one novel by this author, the title character reclaims his honor before Doramin after disgracefully abandoning the *Patna* when it began to sink. In another work by this writer, the narrator uses his boat's steam whistle to repel an attack in which his helmsman is killed by a spear. That work by this man sees the narrator travel to the Inner Station to find an ivory trader named Kurtz. For 10 points, name this Polish-British author who used Marlow as narrator in *Lord Jim* and *Heart of Darkness*.

ANSWER: Joseph **Conrad** [or Jozef Teodor Konrad **Korzeniowski**]

023-12-55-06120

5. When these structures have jets oriented towards the Earth, they are known as BL Lacertae (LAH-sir-tay) objects. They can be found by looking for high levels of X-ray emission, which is caused by their formation as accretions around supermassive black holes. Like radio and Seyfert galaxies, they are a kind of active galactic nucleus. Their high redshift indicates their tremendous distance from Earth and age. For 10 points, identify these astronomical objects, named for their original description as "quasi-stellar radio sources."

ANSWER: **quasars**

019-12-55-06121

6. The title character of this novel is informed by Robert Leaven of the ill health of her aunt, who had earlier sent the protagonist to the Lowood School. The main character of this work assumes her employer is interested in Blanche Ingram and that Grace Poole is responsible for odd events at Thornfield. The title character learns of the madwoman Bertha Mason, the wife of her eventual husband Mr. Rochester. For 10 points, name this novel by Charlotte Bronte.

ANSWER: Jane Eyre

023-12-55-06122

7. This ruler accepted the forty-two articles drafted by John Lambert known as the Instrument of Government. Members of this ruler's army were rewarded for their brilliance despite inferior numbers with a special medal named for the Battle of Dunbar. He emerged as a leading general following his and Thomas Fairfax's defeat of Prince Rupert at the Battle of Marston Moor. For 10 points, name this Lord Protector during the Commonwealth who led Parliamentary forces in the English Civil War.

ANSWER: Oliver Cromwell

130-12-55-06123

8. This author wrote about "forgotten lyres, whose dissonant strings give various response to each varying blast." This author of "Mutability" stated, "The world should listen then, as I am listening now" in a poem about a bird which opens, "Hail to thee, blithe spirit!" He also wrote of the "two vast and trunkless legs of stone" of a boastful figure who demands, "look upon my works, ye mighty, and despair!" For 10 points, name this Romantic poet who wrote "To a Skylark" and "Ozymandias (OZZ-ee-mand-EE-us)."

ANSWER: Percy Bysshe Shelley

020-12-55-06124

9. Recent draft picks by this team include Von Wafer, Jordan Farmar, and Sasha Vujacic (VOO-yah-CHICK). During the 1971-1972 season, this team won thirty-three straight games. One player for this team was suspended after clotheslining J. J. Barea during the 2011 playoffs. After a failed attempt to trade for Chris Paul in 2011, this team traded Lamar Odom to the Dallas Mavericks. For 10 points, name this basketball team, currently led by Kobe Bryant.

ANSWER: Los Angeles Lakers [prompt on Los Angeles or equivalents]

088-12-55-06125

10. In one novel by this author, George Knightley eventually marries the title member of the Woodhouse family, who tries to act as a matchmaker. In another novel by this author, the central family is almost disgraced when the young daughter Lydia elopes with the immoral soldier Wickham. In that novel, the protagonist misjudges the owner of Pemberley, and her sister Jane marries Mr. Bingley. For 10 points, name this British novelist of *Emma* who created Mr. Darcy and Elizabeth Bennet in *Pride and Prejudice*.

ANSWER: Jane Austen

080-12-55-06126

11. The Red Terror in Spain referred to massacres of this group by the Republican forces. Their lifestyle was destroyed by a namesake "Civil Constitution" in 1790. This group comprised part of the "three orders" along with the nobility and commoners. The Carmelites were part of the mendicant subgroup of them who relied on charity to survive, which also included the Franciscans and Dominicans. For 10 points, name this class of people who took religious vows and lived in monasteries.

ANSWER: clergy [accept any specific answer, including monks, nuns, priests, etc; prompt on beggars; prompt on mendicants]

020-12-55-06127

12. This substance was used to blind the Romans, forcing them to retreat in battles against the Parthians. Two Nestorian monks smuggled this substance into the Byzantine Empire. Those transporting this substance braved the inhospitable Taklamakan Desert and made their way to cities like Merv and Samarkand. Mulberry trees were required to produce this substance. For 10 points, name this soft fiber brought from China to the west along a namesake "Road."

ANSWER: **silk**worms

020-12-55-06128

13. One album by this band ends with a sixteen-minute medley including songs like "Mean Mr. Mustard" and "The End." Another album by this band begins with an introduction of "The one and only Billy Shears." One song by this band was originally named "Scrambled Eggs" and states that on the title day, "all my troubles seemed so far away." For 10 points, name this band whose songs, including "Yesterday," were mostly written by John Lennon and Paul McCartney.

ANSWER: The **Beatles**

002-12-55-06129

14. This mythological figure saved the Argonauts when they sailed past the island of the Sirens. He was the son of either Apollo or Oeagrus (oy-AG-russ) and Calliope (kuh-LIE-oh-pee). His severed head came to rest on the island of Lesbos, where it became an oracle. This figure was killed by Maenads (MINE-adz) for not worshiping Dionysus, and after his wife was killed by a snakebite, he followed her to the underworld. For 10 points, name this musician in Greek mythology, who failed to retrieve his wife Eurydice (yu-RID-uh-see).

ANSWER: **Orpheus**

140-12-55-06130

15. Emilio Mola was initially the leader of a rebel group in which this man participated. This man led one side into war after the death of Jose Antonio Primo de Rivera as leader of the Falange (fah-LAHN-hey) Party. This leader allowed for Juan Carlos I to succeed him after his death. Despite help from Germany and Italy in getting this man to power, he kept his nation neutral during World War II. For 10 points, name this man who won the Spanish Civil War and ruled as dictator until 1975.

ANSWER: Francisco **Franco** y Bahamonde

140-12-55-06131



1. Dionysus was the grandson of this city's founder. Dionysus returned to this city when it was ruled by his cousin Pentheus to confront Pentheus for denying Dionysus was divine. The men who built this city had sprung out of the ground when its founder sowed dragon's teeth. In a play by Sophocles, Tiresias (tie-REE-see-us) tells a king of this city that a plague will only be removed when the murderer of King Laius is brought to justice. The murderer turns out to be the king, who also married his mother. For 10 points, name this city founded by Cadmus and ruled at one time by Oedipus.

ANSWER: **Thebes**

121-12-55-06132

2. Several rivers in this province, including the Albany River, flow north and empty into James Bay. Cities in this province include Sudbury and London, and bodies of water within it include Lake Nipigon (NIP-ee-GEE-an) and Georgian Bay. This province borders Manitoba to its west and Quebec to its east. Part of its border with the United States runs through a Great Lake of the same name. For 10 points, name the most populous province of Canada, whose capital is Toronto.

ANSWER: **Ontario**

140-12-55-06133

3. Linus Pauling made an incorrect model about this material in which it had a neutral charge. One discovery about this material was performed in the lab of Maurice Wilkins and was made using Rosalind Franklin's X-ray diffraction data. Unlike its counterpart generated via transcription, this material does not contain uracil. This material's structure was described by Watson and Crick as a double helix. For 10 points, name this material containing an organism's genetic code.

ANSWER: **DNA** [or **deoxyribonucleic acid**]

014-12-55-06134

4. In one work by this artist, a small girl in a blue embroidered coat is holding a watering can. Another painting by this artist depicts a Sunday afternoon at the Moulin de la Galette (moo-LAN de la guh-LET) in the Montmartre (mon-MART) district. In this artist's most famous work, his future wife is in the foreground attempting to kiss a small dog. That painting depicts Gustave Caillebotte (kye-yuh-BOTT) and other friends of this artist eating lunch. For 10 points, name this painter of *Luncheon of the Boating Party*.

ANSWER: Pierre-Auguste **Renoir**

066-12-55-06135

5. This controlling shareholder of Mediaset failed to sell off his shares to avoid a conflict of interest. Until 1981, this man was a member of the secret Propaganda 2 movement that aimed to make his country's government more authoritarian. His other controversial actions include comparing himself to Jesus and soliciting an underage prostitute at a "bunga-bunga party." This man resigned in 2011 over economic reforms. For 10 points, name this man who was recently succeeded by Mario Monti as Prime Minister of Italy.

ANSWER: Silvio **Berlusconi**

105-12-55-06136

This is a calculation question. How many real positive roots will a function with equation "y equals 3 x cubed plus 4 x squared minus 4 x minus 5" have?

ANSWER: **1**

105-12-55-06137

A break-in at what Washington hotel eventually became a scandal that forced Richard Nixon to resign?

ANSWER: **Watergate** Hotel and Office Building

105-12-55-06137