



1. In the elephant toothpaste experiment, a solution containing anions (AN-eye-onz) of this element is poured into hydrogen peroxide to create huge amounts of foam. Along with bromine, it can be used to identify alkenes with a color change. Povidone and this element are the components of the disinfectant Betadine. A solution of this element turns deep blue or purple in the presence of starch. This element is required for the synthesis of thyroxine, and its isotope 131 is used to treat thyroid cancer. For 10 points, name this halogen, which is often added to table salt.

ANSWER: **iodine** [or **I**]

239-13-97-04101

2. This city's location of Red Hill was reportedly the site of a massacre of Circassian nationalists. This city banned the construction of a Pride House, which a judge said would "provoke social-religious hatred." The resort of Roza Khutor (koo-TOR) is near this city. Stephen Fry's open letter to David Cameron suggested finding a location other than this city for a 2014 event. Its mayor, Anatoly Pakhomov, controversially claimed this city featured no homosexual residents. For 10 points, name this Russian city, the host of the 2014 Winter Olympics.

ANSWER: **Sochi**

052-13-97-04102

3. This compound inhibits prolactin secretion when it is released from the tubero-infundibular pathway. The enzyme tyrosine hydroxylase plays a key role in this neurotransmitter's synthesis. The mesolimbic and mesocortical pathways of the brain both use this neurotransmitter. Depletion of this neurotransmitter in the substantia nigra (NYE-gruh) leads to a disease characterized by shaking and other issues with movement. For 10 points, identify this neurotransmitter whose deficiency is a cause of Parkinson's disease.

ANSWER: **dopamine**

126-13-97-04103

4. Irving Langmuir was the inspiration for a character created by this author, who invents a way to instantaneously harden mud to aid soldiers. This author provided his own illustrations for a novel in which the protagonist goes on a berserk killing rampage because he believes that everyone else alive is a robot. In his best-known novel, an optometrist predicts exactly how he will die, since he's been jumping forwards and backwards through time ever since the fire-bombings of Dresden. For 10 points, name this author of *Cat's Cradle* and *Slaughterhouse-Five*.

ANSWER: Kurt **Vonnegut**

190-13-97-04104

5. In a Poisson (PWA-sohn) probability mass function, this function appears the denominator. An extension of this function, which has an output of square root of pi for the value one-half, is the gamma function. For large values, it is well-approximated with Stirling's formula. This function appears in the denominator of each term of a Taylor series. When choosing k objects from n objects, this function is applied to n in the numerator as well as to n and n minus k in the denominator. For 10 points, name this function represented by an exclamation mark.

ANSWER: **factorial**

121-13-97-04105

6. This speech praises John Serrano for giving one of his pizzeria employees a raise, and it compares bad workplace policies to an episode of *Mad Men*. This speech ends with a long story about wounded soldier Cory Remsburg, and it begins by claiming that America, not China, is now "the world's number one place to invest." It was responded to by multiple people, including Cathy McMorris Rodgers and, representing the Tea Party, Mike Lee. For 10 points, name this January 28, 2014, speech given to a joint session of Congress by Barack Obama.

ANSWER: the 2014 **State of the Union** Address

052-13-97-04106

7. Shortly before this battle began, John Keane decided to stay at Lacoste's Plantation rather than advance further. During this battle, the 44th East Essex Regiment forgot the fascines (fah-SEENZ) and ladders needed to cross the canal and scale the earthworks. At this battle, Walter Overton led the defense of Fort St. Philip, and Edward Pakenham died. Pirate Jean Lafitte aided the winning side at this battle. For 10 points, name this battle, fought two weeks after the Treaty of Ghent was signed, where Andrew Jackson defeated the British in the War of 1812.

ANSWER: Battle of **New Orleans**

186-13-97-04107

8. This poet defended the artistic merit of his native language in the treatise *De Vulgari Eloquentia*. He paired his *canzones* with literal and allegorical interpretations in his *Convivio*. His autobiographical *La Vita Nuova* recounts his love for a member of the Portinari family who appears in his most famous poem, in which she guides him through nine spheres. That epic poem of his describes a journey led by Virgil through Purgatory and Hell. For 10 points, name this Italian poet who wrote *The Divine Comedy*.

ANSWER: **Dante** Alighieri [or Dante **Alighieri**]

014-13-97-04108

9. A woman in this opera is caught stealing by a page who sings "Thief! Thief!," but the title character comes to her aid. The protagonist of this opera plays a shepherd's pipe at its opening. This opera took its inspiration from a painting by Hieronymus Bosch, and it includes a scene in which the protagonist's mother sings "All That Gold." At its end, the title character offers his sole possession, a crutch, to King Melchior and has his lame leg healed as a reward. For 10 points, name this Christmas-themed opera by Gian Carlo Menotti, the first to be composed for American television.

ANSWER: **Amahl and the Night Visitors**

088-13-97-04109

10. During this period, the Action Programme implemented freedom of speech and the press. During this event, *The Two Thousand Words* manifesto was published by Ludvik Vaculik (VAH-choo-lik). Many of the leaders during this period later joined Charter 77. Gustav Husak (HOO-shock) undid most of the reforms passed during this event, which attempted to establish "socialism with a human face." Leonid Brezhnev sent in troops provided by the Warsaw Pact to end this event. For 10 points, name this period of liberal reforms in Czechoslovakia, started by Alexander Dubcek (DOOB-check) in 1968.

ANSWER: **Prague Spring** [or **Prazske jaro**]

186-13-97-04110

11. This term can be applied to the title location of a novel consisting of a fictional manuscript by Avis Everhard in which most workers live in the city of Asgard. That novel is Jack London's *The Iron Heel*. In a novel set in one of these societies, Captain Beatty is the superior of the increasingly rebellious Guy Montag. The United States in Ray Bradbury's *Fahrenheit 451* is one of these places, because books are outlawed by the government. For 10 points, give this term for a usually futuristic society that is highly undesirable, the opposite of a utopia.

ANSWER: **dystopia** [or **dystopian**; prompt on **dictatorship**; prompt on **oligarchy**]

052-13-97-04111

12. In Game 6 of the 2004 ALCS, this player swatted the ball out of Bronson Arroyo's glove when Arroyo tried to tag him. After Aaron Boone injured his knee in a game of pickup basketball, this player was traded to his current team for Alfonso Soriano and Joaquin Arias. Raul Ibanez hit a game-winning home run after pinch-hitting for this player in the 2012 postseason. Arbitrator Fred Horowitz reduced this man's suspension from 211 games to the entire 2014 season for his role in the Biogenesis scandal. For 10 points, name this New York Yankees third baseman.

ANSWER: Alexander Emmanuel **Rodriguez** [or **A-Rod**]

186-13-97-04112

13. BH3-only proteins such as Bim and Bid promote this process once they are activated by Fas ligand binding its receptor. Trophic factors prevent this process from occurring. Mutant CED protein in *C. elegans* causes defects in this pathway. In eukaryotes, it is caused when Bcl-2 no longer prevents the release of cytochrome C from the mitochondria. This process results in a cascade of caspases. Damage to p53 causes this process to occur in healthy cells, though defects in it are indicative of cancer. For 10 points, name this process of programmed cell death.

ANSWER: **apoptosis** [prompt on cell **death** until it is read]

190-13-97-04113

14. In a novel by this man, the title character discovers a phage (FAYJ) that destroys bacteria, shortly after his wife dies of the bubonic plague. A character created by this author is an alcoholic lawyer who becomes a Methodist minister in Zenith, a city in Winnemac. He wrote about Paul Resiling, who shoots his wife Zilla, in one of his novels. This author of *Arrowsmith* and *Elmer Gantry* also created Carol Kennicott, who becomes dissatisfied with Gopher Prairie, Minnesota. For 10 points, name this American author of *Babbitt* and *Main Street*.

ANSWER: Sinclair **Lewis**

186-13-97-04114

15. This man supposedly dismissed the report of two Yale professors about "rocks that fell from the sky." This scientist was inspired by the Chinese to create a "Great Clock" that used a gong to signal the hour. Though not Franklin, he wrote to John Jay about interchangeable parts while ambassador to France in 1785. He ordered an expedition that documented hundreds of new species in the as-yet-unexplored Louisiana Purchase, which he made. For 10 points, name this man who designed the University of Virginia campus and his home, Monticello, and also ordered the Lewis & Clark Expedition.

ANSWER: Thomas **Jefferson**

239-13-97-04115



1A. What conic section is obtained by intersecting a plane in any orientation with both halves of a double cone?

ANSWER: **hyperbola**

1B. What kind of blackbody radiation, named for a British physicist, is produced by black holes?

ANSWER: **Hawking** radiation

2A. What Frenchman created an international incident in 1793 when he traveled through the U.S. trying to raise anti-British sentiment and arm privateers to fight with the French?

ANSWER: Edmond-Charles **Genet** [or Citizen **Genet**]

2B. What language spoken in the canton of Grisons (GREE-zun) is one of the official languages of Switzerland along with French, Italian, and German?

ANSWER: **Romansh** language

3A. This is a 20-second calculation question. What is the slope of the line containing the points (-2, 8), (1, -1), and (3, -7)?

ANSWER: **-3**

3B. This is a 20-second calculation question. How many different ways can I make a hop, a skip, and a jump if I can make 3 different hops, 4 different skips, and 10 different jumps?

ANSWER: **120** ways

4A. What leader of Israeli forces in the 1948 Arab-Israeli War served as the first prime minister of Israel?

ANSWER: David **Ben-Gurion**

4B. What term is used to describe the novels of Gabriel Garcia Marquez and Toni Morrison, which incorporate fantastical elements into a naturalistic narrative?

ANSWER: **magical realism**

5A. What 1996 Adam Sandler movie stars Christopher McDonald as the arrogant Shooter McGavin and Carl Weathers as a one-handed retired golfer?

ANSWER: **Happy Gilmore**

5B. What American composed *Lincoln Portrait* and *Appalachian Spring*?

ANSWER: Aaron **Copland**

6A. What inefficient sorting algorithm is named for the manner in which smaller elements float to the top of the list?

ANSWER: **bubble** sort

6B. What English poet wrote the sonnets "Composed Upon Westminster Bridge" and "The World Is Too Much With Us?"

ANSWER: William **Wordsworth**

7A. What Jewish holiday commemorates the events recounted in the Book of Esther?

ANSWER: **Purim**

7B. Ibirapuera (ee-bee-rah-PWEH-ruh) Park is in what most populous Brazilian city, which is also the largest city in the Southern Hemisphere?

ANSWER: **Sao Paulo**

8A. BCS theory attempts to explain what phenomenon in which a material's electrical resistance drops to zero?

ANSWER: **superconductivity**

8B. Oedipa Maas is the protagonist of what short novel by Thomas Pynchon?

ANSWER: *The **Crying of Lot 49***

9A. This is a 30-second calculation question. An isosceles trapezoid has one base 8 centimeters long and the other 14 centimeters long. If the other two sides are each 5 centimeters long, what is the area of the trapezoid?

ANSWER: **44** square centimeters

9B. This is a 30-second calculation question. If cosine of x equals three over the square root of ten, and sine of x equals one over the square root of ten, what is the cosine of quantity four times x ?

ANSWER: **0.28** [or **7/25**]

10A. What English philosopher denied the existence of innate ideas in his *An Essay Concerning Human Understanding*?

ANSWER: John **Locke**

10B. In what war did the Duke of Marlborough win the Battle of Blenheim (BLEN-um) in 1704?

ANSWER: War of the **Spanish Succession**



1. The scientific name of an animal named for this color is *Balaenoptera musculus*. This color is produced by radiation from particles modeled by the Frank-Tamm formula. Ferrocyanide salts can be found in a pigment of this color named for Prussia. Stars of this color inhabit the left part of the Hertzsprung-Russell diagram, which includes the star Rigel (RYE-jul). A solvated electron forms when alkali metals are dissolved in ammonia, displaying this color. It is not green, but solutions of copper ions are this color. For 10 points, what color does Rayleigh scattering impart to the sky?

ANSWER: **blue**

239-13-97-04117

2. In a scene in this film, the protagonist is punched in the face by Mr. Welch, the husband of a teacher. In the last scene, the main character finds a copy of *The Adventures of Tom Sawyer*. The protagonist of this film is excited to discover his daughter Zuzu's petals in his pocket, which means that he is back in Bedford Falls and not the hellish Pottersville. In this movie, Clarence Odbody is an angel who wants to obtain his "wings." For 10 points, name this Frank Capra film about George Bailey, a man who wishes he had never been born.

ANSWER: **It's a Wonderful Life**

052-13-97-04118

3. In the Cori cycle, this compound is formed in the liver. GLUT1 transports it into cells. This pyranose (PIE-rah-nose) is phosphorylated by hexokinase in the first step of the EMP pathway. Maltose consists of two monomers of it. This compound, which has only equatorial hydroxyl groups in its cyclic form, is modified to make the monomer of chitin (KITE-in). Glycogen acts as storage for this compound. Insulin responds to high blood levels of it. This compound is metabolized into two pyruvates, producing 2 ATP and 2 NADH, during glycolysis. For 10 points, name this six-carbon sugar.

ANSWER: **glucose** [or **dextrose**; or **C 6-H 12-O 6**]

190-13-97-04119

4. This man turned down an opportunity to be the first president of Texas A&M University. During the Battle of Monterrey, he led a successful charge on the La Teneria fort. This Secretary of War in Franklin Pierce's cabinet was captured while Given Campbell attempted to help him escape. His vice-president gave the "Cornerstone" speech and was Alexander Stephens. This man ordered Pierre Beauregard to attack Fort Sumter and gave Robert E. Lee command of the Army of Northern Virginia. For 10 points, name this only president of the Confederate States of America.

ANSWER: Jefferson Finis **Davis**

186-13-97-04120

5. The portion of these things where the rate of deposition is greater than ablation is the accumulation zone. Erosion due to these things is divided into abrasion and plucking. The action of these things turns stream-formed V-shaped valleys into U-shaped valleys. A characteristic deposit of these things is a mixture of boulders and clay, also called till, which is deposited in moraines. When these things calve (KAHV), they form icebergs. For 10 points, name these dense accumulations of ice that flow like very, very slow rivers.

ANSWER: **glaciers** [or **ice sheets**]

066-13-97-04121

6. A character in this poem has the epithets "man-killing" and "breaker of horses." This poem begins with the word "menin," meaning "rage," and asks which of the gods caused two men to quarrel. It describes the death of Sarpedon, whose body is rescued by Apollo at Zeus's command. This poem describes the funeral games played in honor of Patroclus, whose death causes his friend to make peace with Agamemnon and seek out and kill Hector. For 10 points, name this Homeric epic about the wrath of Achilles during the Trojan War.

ANSWER: the ***Iliad***

014-13-97-04122

7. A cathedral in this city was designed by Konstantin Thon and was started on this city's Sparrow Hills. Dmitry Donskoy led this city when it defeated the Tatars at the Battle of Kulikovo (koo-lee-KOH-voh). This city is home to the largest Orthodox cathedral in the world, the Cathedral of Christ the Savior. Ivan the Terrible allegedly blinded the architect of this city's eight-domed cathedral, built to honor Ivan's conquest of Kazan (kuh-ZON). This city was burned after Napoleon won the Battle of Borodino. For 10 points, name this Russian city, home to St. Basil's Cathedral and the Kremlin.

ANSWER: **Moscow** [or **Moskva**]

186-13-97-04123

8. During John Adams's lame duck period, this man served as Secretary of State after Timothy Pickering was fired. This man, Elbridge Gerry, and Charles Pinckney made up the delegation to France during the XYZ Affair. He wrote, "The power to tax involves the power to destroy" in his highest office, in which he followed Oliver Ellsworth. In that role, he also opined that the Judiciary Act of 1789 was unconstitutional, laying the groundwork for judicial review. For 10 points, name this Supreme Court Chief Justice who presided over *Marbury v. Madison*.

ANSWER: John **Marshall**

190-13-97-04124

9. The main character of this novel tries to help a man using the alias Provis escape from Arthur Compeyson. A character in this novel is engaged to Bentley Drummle. This novel's protagonist befriends Herbert Pocket and receives help from Mr. Jaggers. The blacksmith Joe Gargery takes in the main character of this novel before he goes to live with Miss Havisham and Estella, and then travels to London with money from Abel Magwitch. For 10 points, name this coming-of-age novel about the orphan Pip that was written by Charles Dickens.

ANSWER: ***Great Expectations***

023-13-97-04125

10. This artist sampled Smokey Robinson's "Will You Still Love Me Tomorrow" in a song that declares that "we ain't married but tonight I need some consummation." This man collaborated with Bon Iver's Justin Vernon on the song "Lost in the World." At a benefit event, this rapper declared that "George Bush doesn't care about black people." This rapper of *808s and Heartbreaks* and *My Beautiful Dark Twisted Fantasy* interrupted Taylor Swift at the 2009 MTV Video Music Awards. For 10 points, name this rapper of "All of the Lights" and the album *Yeezus*.

ANSWER: Kanye Omari **West** [or **Kanye**; prompt on **Yeezus** until it is read]

186-13-97-04126

11. Picrotoxin and bicuculline (BUY-cook-YOU-lean) antagonize this compound's receptors. An agonist of this compound produced by the *Amanita* mushroom is called muscimol (MUSK-im-all). This compound is synthesized by decarboxylation of glutamic acid using a Vitamin B6 cofactor. This neurotransmitter's receptors are divided into A & B types and are the target of benzo-diaz-epines. It has a role similar to that of glycine. For 10 points, name this chief inhibitory neurotransmitter, which has a four letter acronym.

ANSWER: **GABA** [or **gamma-amino butyric acid**]

245-13-97-04127

12. A character in this novel creates forty-nine dumplings in the shape of human heads and throws them into a river. Another character in this novel blockades a group from crossing a bridge with his thunderous voice. A character in this novel summons the southeastern wind before the Battle of Red Cliffs. This novel begins with the Oath of the Peach Garden, where Zhang (JUNG) Fei, Guan Yu, and Liu Bei become brothers. For 10 points, name this Chinese novel by Luo Guanzhong (gwan-JUNG) that recounts the struggle between the Wu, Wei, and Shu states.

ANSWER: **Romance of the Three Kingdoms** [or **Sanguo Yanyi**]

227-13-97-04128

13. Minerva saved a victim of this man who had achieved insight by looking at the spine of a fish. This man used honey to attract an ant into walking through a seashell. After this man pushed his nephew Perdix off of the Acropolis, Minerva turned Perdix into a partridge. Either this man or the daughters of Cocalus (coh-CAL-us) killed his former employer, the husband of Pasiphae (PASS-if-ey). For 10 points, name this father of Icarus who designed the Labyrinth.

ANSWER: **Daedalus** [or **Daedalos**; or **Taitale**]

186-13-97-04129

14. This play includes a monologue that uses phrases about a courier with a "cap out of fashion" and "French withered pears" to discuss virginity. That monologue in this play is delivered by a man whose cowardice is revealed when he attempts to betray Florence, named Parolles (puh-ROLE-eez). A character who tries to seduce Diana in this play is deceived into sleeping with his own wife. For 10 points, name this Shakespeare comedy which concludes with Bertram and Helena deciding to live as a married couple, proving the title adage about disregarding adversity on the path to happy resolutions.

ANSWER: **All's Well That Ends Well**

019-13-97-04130

15. In Jean-Antoine Watteau's painting *Pierrot*, a man of this profession can be seen with a donkey. A member of this profession, Franklin West, is taking notes in a painting that depicts a woman shielding her eyes. A melancholy man rests his face on his hand in Van Gogh's portrait of one of these men, Paul Gachet (guh-SHAY). In another painting, a man from this profession holds a needle near the corpse of the executed robber Aris Kindt. For 10 points, name this profession of Rembrandt's subject Nicolaes Tulp and Samuel Gross, whose clinic was depicted in a painting by Thomas Eakins.

ANSWER: **doctor** [or equivalents, such as **physician**]

030-13-97-04131



1. During the Trojan War, Diomedes (die-OH-med-eez) crushed this man's hip with a stone. This man's crew saves Achaemenides (uh-kie-MEN-ih-deez) from the island of the Cyclopes. This hero kills the Rutulian king Turnus to avenge Evander's son Pallas. He visits his father in the underworld by using a golden bough after abandoning the Carthaginian queen Dido. This son of Anchises (un-KIE-seez) is celebrated as an ancient founder of Rome. For 10 points, name this hero whose travels were chronicled in a namesake epic by Virgil.

ANSWER: Aeneas

186-13-97-04132

2. If a function satisfies Laplace's (luh-PLOSS-iz) equation, then its mean value on the surface of this figure equals its value at this figure's center. The gravitational force exerted by a shell of this shape on a particle inside the shell is always zero. The constant of proportionality for moment of inertia of a hollow one of these is two-thirds, while a solid one has constant two-fifths. This is the shape of the orbital with azimuthal quantum number zero, known as the s orbital. For 10 points, identify this shape which has volume four-thirds pi r-cubed.

ANSWER: spheres [or word forms, such as spherical]

233-13-97-04133

3. A city in this state was the first to implement the kindergarten through twelfth grade education system. At a convention in this state, Sojourner Truth delivered the "Ain't I a Woman" speech. It's not Kentucky, but a poet from this state wrote in his poem "Sympathy" that "I know why the caged bird sings." In this home state of Paul Lawrence Dunbar, I.M. Pei built the Rock and Roll Hall of Fame. The Pro Football Hall of Fame is located in this state's city of Canton. This state's largest cities include Cincinnati and Cleveland. For 10 points, name this "Buckeye state."

ANSWER: Ohio

186-13-97-04134

4. De-nitri-fication is an example of one of these reactions, which transforms nitrate into nitrogen gas. In biology, the transformation of NAD⁺ into NADH is one of these reactions. During electroplating, metal cations (CAT-eye-onz) undergo this type of reaction. The species which undergoes this reaction will have a greater standard electrode potential in a galvanic cell, will be located at the cathode, and will have an algebraic decrease in its oxidation state. For 10 points, name these reactions in which a species gains electrons, often contrasted with oxidations.

ANSWER: reductions [prompt on redox reactions; prompt on oxidation-reductions; prompt on reduction-oxidations; do not accept or prompt on "oxidations"]

190-13-97-04135

5. Julius Caesar described seeing men dyed with woad while twice doing this action. The last successful instance of this feat was followed by the Harrying of the North and included a battle that featured the death of several housecarls. Napoleon envisioned accomplishing this feat with balloons and a massive tunnel, and Operation Sea Lion was a failed German attempt to do this action. It was most recently performed by the king who ordered the creation of the Domesday Book. For 10 points, identify this kind of military conquest which gave William the Conqueror his name.

ANSWER: invading Britain [or invading England or other equivalents]

141-13-97-04136

This is a calculation question. A point is expressed in polar coordinates as $(3, \pi)$, meaning that it is 3 units away from the origin and at an angle of π radians. What are the Cartesian coordinates of this point?

ANSWER: **$(-3, 0)$**

What student of Franz Boas wrote *Patterns of Culture* and *The Chrysanthemum and the Sword*?

ANSWER: Ruth **Benedict**