



1. This leader and issuer of the Fundamental Laws was opposed by a worker's march led by the priest Father Gapon. Sergei Witte (sir-GAY VITT-uh) urged this ruler to release the reformist October Manifesto, in which he promised to create a legislature called the Duma (DOO-mah), before he violently put down protestors at his Winter Palace on Bloody Sunday. This man's court was attended by the mystic Rasputin. For 10 points, name this Romanov ruler whose execution by the Bolsheviks made him the last tsar of Russia.

ANSWER: **Nicholas II** of Russia [or **Nikolay Aleksandrovich**; prompt on **Nicholas**]

104-12-55-08101

2. Until 1987, no building in this city was taller than the statue on top of City Hall. One conference in this city grew out of the unanimous recommendation of a convention in Annapolis. This city fell to British occupation after a loss at the Battle of Brandywine. An assembly in this city received a recommendation by Richard Henry Lee to declare thirteen colonies to be independent. For 10 points, name this city that is home to Penn's Landing and is the site of Independence Hall.

ANSWER: **Philadelphia**

002-12-55-08102

3. One of these events ended after its Magyar (MAG-yahr) language-enforcing leader fled to America; that nationalist was Lajos (LA-yosh) Kossuth. Another one of these events began with the banning of a banquet and ended with the presidency of Louis Blanc. During this period of time, Metternich resigned as an Austrian diplomat, but Great Britain and Russia were spared any trouble. For 10 points, what uprisings broke out across Europe during a specific year of the mid-nineteenth century?

ANSWER: European revolutions of **1848** [or the **Springtime of Peoples**; prompt on "revolts" or other more general answers]

104-12-55-08103

4. This structure splits at the L4 vertebral level and passes through the diaphragm at the T12 vertebral level. This structure's wall contains a high concentration of elastin. This structure's wall is weakened in Marfan's syndrome, and its ascending and descending portions are connected by an arch. A set of semilunar valves separate it from the left ventricle, which pumps blood into it. For 10 points, name this largest artery in the body that originates in the heart.

ANSWER: **aorta**

048-12-55-08104

5. About a year before this battle, the namesake location was won after five days of house-to-house fighting by Ben Milam. Couriers carrying pleas for help were sent out of this battle's namesake location by its commander William B. Travis. During this battle, renowned knife fighter Jim Bowie and famed frontiersman Davy Crockett fought and defended for the losing side. For 10 points, name this thirteen day siege by Antonio Lopez de Santa Anna of a mission located in San Antonio, Texas.

ANSWER: Battle of the **Alamo**

130-12-55-08105

6. The Rhes (RESS) protein may be a major cause of this disease, whose Westphal variant has very early onset. It is characterized by extra glutamine (GLUE-tah-mean) residues in the PolyQ sequence of chromosome four, leading to thirty-six repeats of the nucleotide CAG, which forms a mutated protein named for this disease. In this disease, atrophy of the striatum (stry-EY-tum) causes jerky movements called chorea (koh-REE-ah). For 10 points, name this hereditary neurodegenerative disorder that usually onsets around age forty.

ANSWER: **Huntington's** disease [accept **chorea** before mentioned]

079-12-55-08106

7. During this war, the desertion of Saint Patrick's Brigade was the highpoint of one side's leaflet campaign that attempted to demoralize their enemies. It broke out over a boundary dispute around the Nueces (new-AY-SAY-s) River. Battles during this war include the Battle of Cerro (SERRO) Gordo and the Battle of Buena Vista. Zachary Taylor became a hero during this war that saw the U.S. capture Veracruz. For 10 points, name this 1840s war ended by the Treaty of Guadalupe Hidalgo that pitted the U.S. against its southern neighbor.

ANSWER: **Mexican-American** War

040-12-55-08107

8. The momentum of this particle is equal to h -bar times the wave vector. This particle is the only massless gauge boson involved in the electroweak interaction. These particles undergo Compton scattering, and one of these particles generates an electron and a positron in pair production. It is the carrier of the electromagnetic force, and the energy of this particle is equal to Planck's constant times frequency. For 10 points, identify these particles, the quantized units of light.

ANSWER: **photons**

126-12-55-08108

9. The protagonist of this novel is offended by a red-haired guitarist as he drinks pomegranate juice on a terrace, and he is told that the man who rowed his boat is a criminal. In this novel, the protagonist is relieved when his luggage is accidentally sent to Como. The protagonist, an aging writer, falls obsessively in love with the Polish boy Tadzio ("TODD"-zee-oh). Ultimately, cholera kills that writer, Gustav von Aschenbach (OSH-un-BOCK). For 10 points, name this short novel by Thomas Mann set in the title Italian city.

ANSWER: ***Death in Venice*** [or ***Der Tod in Venedig***]

014-12-55-08109

10. A building named after Sultan Abdul Samad is found in this city's Merdeka Square. The May 13th Riots occurred in this city, which is in the Klang Valley. Some of the functions of this capital were moved to the planned city of Putrajaya. Deejay Cerico engineered, and Cesar Pelli was the architect of, one building complex in this city, which is comprised of two towers and was the world's tallest building until 2004. For 10 points, name this home of the Petronas Towers, the capital of Malaysia.

ANSWER: **Kuala Lumpur**

040-12-55-08110

11. One method to perform this operation is known as partial fraction expansion. Green's theorem relates the line form of this operation to the double form. One way to approximate this operation is with the trapezoidal rule, which improves upon the rectangle method. The fundamental theorems of calculus both involve this operation. For 10 points, name this operation that allows one to find the area under a curve and whose indefinite form is known as an antiderivative.

ANSWER: **integration** [or equivalent like "calculating an **integral**"]

066-12-55-08111

12. In one work by this man, Tiresias's (tie-REE-see-uhs) home is destroyed by the king of Thebes. This author of that work about the death of Pentheus wrote a play in which Theseus wishes for his son's death after Phaedra commits suicide. This author of *The Bacchae* (BOCK-eye) and *Hippolytus* (hih-PAHL-ih-tuss) also wrote a play in which Glauce (GLAU-kay) and Creon die from a poisoned robe sent by the title sorceress. That character murders the children she bore with Jason. For 10 points, name this ancient Greek playwright of *Medea*, the third major tragedian.

ANSWER: **Euripides**

105-12-55-08112

13. The Iguazu joins the Parana river as it enters this country. The highest peak in this country is one of the Seven Summits, and is the highest peak in both of the hemispheres it is in. This country's northern border is formed by the Rio de la Plata. This country still claims that it is the owner of the Falkland Islands. For 10 points, name this South American country where one can climb Mount Aconcagua (AH-con-COG-wah), ride through Patagonia, and visit Buenos Aires.

ANSWER: **Argentina**

002-12-55-08113

14. The presence of this element is used to test whether a star is a brown dwarf. A form of this element with carbonate appears to limit the release of some neurotransmitters, and is thus often given to sufferers of bipolar disorders. During Big Bang nucleosynthesis (new-klee-oh-SIN-theh-sis), helium and beryllium were produced along with this element. Its large electrochemical potential makes it a common choice for anodes in batteries. It has the smallest atomic number of its group, which includes sodium and potassium. For 10 points, name this alkali metal.

ANSWER: **lithium**

121-12-55-08114

15. This man was influenced by the geological work of his friend Charles Lyell; he collected data for Lyell while traveling with Robert FitzRoy. Thomas Huxley debated the work of this man with Samuel Wilberforce, leading Huxley to be called this man's "bulldog". This author wrote about sexual selection in *The Descent of Man*, while another work is based in part on the differences in beaks found in various Galapagos finches. For 10 points, name this author of *On the Origin of Species*.

ANSWER: Charles **Darwin**

064-12-55-08115



1A. Who composed the ballets *Petrouchka* (pe-TROOSH-ka) and *The Firebird*?

ANSWER: Igor **Stravinsky**

1B. Name the Renaissance painter of the *Mona Lisa* and *The Last Supper*.

ANSWER: Leonardo di ser Piero **da Vinci**

2A. Which Habsburg Holy Roman Emperor fought the Schmalkaldic (shmall-CALL-dick) League in Germany and Francis I of France after presiding over the Diet of Worms (VURMS) during his four-decade tenure?

ANSWER: **Charles V** [or **Charles I of Spain**; prompt on **Charles**]

2B. What class of elementary particles named for an Italian-American physicist have half-integer spin and obey the Pauli exclusion principle?

ANSWER: **fermions**

3A. What city is home to Anish Kapoor's sculpture *Cloud Gate*, commonly called "The Bean", as well as Alexander Calder's *Flamingo*, and is the namesake of a school of architecture including architects such as Louis Sullivan?

ANSWER: **Chicago**

3B. This is a 10-second calculation question. Multiply $3 - 4i$ by its complex conjugate.

ANSWER: **25**

4A. This is a 10-second calculation question. All spades are removed from a standard deck of playing cards. What is the probability of drawing a five or a club or both from the new deck? Express your answer as a fraction in reduced form.

ANSWER: **5/13**

4B. A blue dress was used as evidence that President Bill Clinton had an extramarital affair with which White House intern, leading to his impeachment?

ANSWER: Monica Samille **Lewinsky**

5A. Which Peruvian novelist and Nobel Prize winner wrote *Aunt Julia and the Scriptwriter*?

ANSWER: Mario **Vargas Llosa** (VAR-gus YO-sah)

5B. What fatty material allows neurons to transmit signals faster by forming a namesake sheath around them?

ANSWER: **myelin**

6A. Baron Samedi (suh-MED-ee) is among the loa (LOW-uhz) that serve as intermediaries to Bondye (BOND-yay) in what religion of the Caribbean that synthesizes Catholic and Yoruba traditions?

ANSWER: **Voodoo**

6B. Which Prime Minister formed a coalition with Nick Clegg in order to take power from Gordon Brown?

ANSWER: David **Cameron**

7A. This is a 20-second calculation question. If an unladen swallow flies east at 25 miles per hour for 2 hours, then flies west at 30 miles per hour for 3 hours, what is its net average velocity? Speed and direction required.

ANSWER: **8** miles per hour **west**

7B. This is a 20-second calculation question. An equilateral triangle of side length 3 is divided into four congruent equilateral triangles, which are themselves divided into four congruent equilateral triangles. What is the area of each of the small triangles? Express your answer in simplest radical form.

ANSWER: **9** times the square **root** of **3** all over **64** [or **nine-sixty-fourths** times the square **root** of **3**; or **9*sqrt(3)/64**; or **9 square roots of 3 over 64**]

8A. What comic book character is perpetually stuck in a love quadrangle with Cheryl Blossom, Veronica Lodge, and Betty Cooper?

ANSWER: **Archie** Andrews

8B. What type of poem usually fourteen lines long comes in Italian and English varieties?

ANSWER: **sonnet**

9A. What former St. Louis Cardinal first baseman agreed, in December 2011, to join the Los Angeles Angels?

ANSWER: Albert **Pujols** (POO-holes)

9B. What action did Emile Durkheim (DIRK-hime) divide into anomic, egoistic, fatalistic, and altruistic causes in a pioneering work of sociology?

ANSWER: **suicide** [or obvious equivalent]

10A. This is a 30-second calculation question. Consider a stem-and-leaf plot whose first row has stem 2 and leaves 0, 0, 3, 4, 8; whose second row has stem 3 and leaves 0, 3, 4; and whose third row has stem 4 and leaf 0. What is the mean of the data set represented by this plot?

ANSWER: **28**

10B. This is a 30-second calculation question. If x is a first-quadrant angle and $\sin x$ equals $5/6$, then what is $\sin 2x$? Express your answer in simplest radical form.

ANSWER: **5** times the square **root** of **11** all **over 18** [or **five-eighteenths** times the square **root** of **11**; or **(5/18)sqrt(11)**; or **(5*sqrt(11))/18**; or **5 square roots of 11 over 18**]



1. In Latin, negative versions of this kind of verb are formed by adding *nolle* (KNOW-lay) to an infinitive, and the positive type is pluralized by adding the suffix *-te*. In Spanish, this verb form is replaced with the subjunctive form when the subject is *usted* (oo-STED) or in a negative sentence. In German, this kind of verb may be optionally replaced by an infinitive. In English, the second-person subject of these verbs is often silent, as in "go away." For 10 points, name this verb mood that is used to give commands.

ANSWER: **imperative** mood [prompt on **command** form before it is read]

142-12-55-08117

2. Depending on the chirality (kie-RALL-ih-tee) of these molecules, they can be syndiotactic (SIN-dee-oh-tack-tick), atactic (AY-tack-tick), or isotactic (IY-soh-tack-tick). They can gain enhanced structural properties through crosslinking. Branching allows them to take on shapes like a star, comb, and brush. Rubber is an example of one of these substance using isoprene (IY-soh-preen) as a building block; other examples include nylon and most plastics. For 10 points, name these macromolecules formed by a repeating subunit called a monomer.

ANSWER: **polymer**

064-12-55-08118

3. One character in this film is trained by Henri Ducard and attempts to assassinate Joe Chill. Ducard later burns down that man's house and fights him on a train. A microwave emitter is stolen in this film from a company that also produces a "tumbler" vehicle. Katie Holmes portrays the assistant District Attorney Rachel Dawes in this film, and is the love interest of a billionaire played by Christian Bale. For 10 points, name this first film in the Christopher Nolan-directed Dark Knight trilogy.

ANSWER: **Batman Begins**

002-12-55-08119

4. This law can be derived by manipulating the equation for chemical potential then substituting fugacity with a simpler quantity. Deviations from this law can occur with strong interactions between two different components; in general, substances that deviate from this law are called azeotropes (AY-zee-oh-tropes). Even in non-ideal conditions, this law holds for the solvent of a very dilute solution. For 10 points, name this law which states that the total vapor pressure of a solution is equal to the sum of each individual vapor pressure times its mole fraction.

ANSWER: **Raoult's** law

064-12-55-08120

5. In one poem by this man, the speaker exclaims, "What fond and wayward thoughts will slide into a lover's head!" after beginning, "Strange fits of passion have I known." This author of the "Lucy poems" wrote a long autobiographical poem called *The Prelude*. This poet wrote about revisiting the banks of the Wye in "Lines Composed a Few Miles above Tintern Abbey." For 10 points, name this English Romantic poet who collaborated with Samuel Taylor Coleridge on the collection *Lyrical Ballads*.

ANSWER: William **Wordsworth**

014-12-55-08121

6. Substances that lower this quantity are typically amphiphilic (am-fih-FILL-ick), meaning they contain hydrophobic (high-droh-FOH-bick) and hydrophilic (high-droh-FILL-ick) domains and can form structures like micelles (MY-cells). In a thin enough tube, this quantity results in a type of creeping action called the capillary action. Surfactants lower this quantity which causes a type of curve called a meniscus. For 10 points, name this type of force at the surface of a liquid that allows water striders to walk on water.

ANSWER: **surface tension**

064-12-55-08122

7. In this novel, Peter Coffin vouches for one character because he pays regularly. The protagonist of this novel is surprised to find that character, who later builds his own coffin, in attendance at Father Mapple's sermon. Elijah warns the protagonist of this novel about a man attended by the mysterious Fedallah. In this novel, Starbuck considers shooting his captain to save the Pequod, and Queequeg befriends Ishmael. For 10 points, name this novel in which Captain Ahab chases a white whale, a work of Herman Melville.

ANSWER: **Moby-Dick**

105-12-55-08123

8. In one poem by this author, the title entity "sits looking over harbor and city on silent haunches" after it "comes on little cat feet." In another poem, this man tells the subject, "They tell me you are wicked and I believe them, for I have seen your painted women under the gas lamps." This author of a six-volume biography of Abraham Lincoln addressed that poem to the "City of the Big Shoulders" and "Hog Butcher for the World." For 10 points, name this American poet of "Fog" and "Chicago."

ANSWER: Carl **Sandburg**

002-12-55-08124

9. Some underwater forms of these structures are called guyots. The Taconic, Acadian and Alleghenian (AL-uh-gain-eean) orogenies formed a notable one of these structures. The lee side of these structures may be very dry due to the creation of a "rain shadow." The fold type of these structures are the most common and are formed by the head-on collision of two tectonic plates. For 10 points, name these geologic structures which include the Himalayas.

ANSWER: **mountains** [or **mountain ranges**; prompt on plateau before "Taconic"]

066-12-55-08125

10. In this work, Frances won't allow her boyfriend to go on any trip that involves seeing a girl. Nevertheless, that boyfriend falls in love with a socialite who intends to marry the Scottish veteran Mike. That socialite briefly runs off with a young bullfighter and had treated the protagonist's war wound. In this novel, the boxer Robert Cohn travels to Spain with the protagonist and futilely loves Lady Brett Ashley. For 10 points, name this novel about Jake Barnes written by Ernest Hemingway.

ANSWER: *The* **Sun Also Rises**

105-12-55-08126

11. Protests against an event related to this structure used the motto "Law Not War." This structure was the subject of the Protocols of Sevres (SEV-ruh). The Battle of Jebel Haitan (JEB-ul HEIGHT-un) resulted from Operation Kadesh, which began a takeover of this structure. This entity was constructed by Ferdinand de Lesseps. Anthony Eden resigned following Eisenhower's disapproval of a forced takeover of this structure. For 10 points, name this Egyptian canal whose nationalization by Nasser led to its namesake crisis.

ANSWER: **Suez Canal**

149-12-55-08127

12. One image in this poem is of children striving at recess "in the ring," while another is of the setting sun above fields of "gazing grain." Near its end, the speaker comes to a house which is described as "a swelling in the ground" whose roof was "scarcely visible." The speaker surmises that, since centuries have felt shorter than a day, "the horses' heads were toward eternity." This revelation takes place inside a carriage which the title figure "kindly stopped for me." For 10 points, name this poem by Emily Dickinson.

ANSWER: "**Because I could not stop for Death**"

040-12-55-08128

13. This figure's death was caused when he fell in love with Iole (ee-OH-lay), causing this figure to receive a garment from his wife, Deianeira (DYE-uh-NAIR-uh). That clothing was covered in the blood of the centaur Nessus, whom this man killed. This man also worked for Eurystheus (yoo-RIS-thee-US), for whom he captured the mares of Diomedes (dye-OHM-uh-DEES) and killed the Hydra. For 10 points, name this hero from classical mythology who completed the Twelve Labors and was a son of Zeus.

ANSWER: **Hercules** [or **Heracles**]

023-12-55-08129

14. This composer's *Serenade for Strings* in C major contains a famous second-movement waltz. He wrote an unnumbered symphony based on the Byron poem "Manfred," and he also composed the "Polish" and "Winter Dreams" symphonies. The clarinets and bassoons play the Friar Lawrence theme to begin this man's *Romeo and Juliet* overture. He also wrote a piece that included "La Marseillaise" and "God Save the Tsar," and featured cannons. For 10 points, name the composer of the *1812 Overture*.

ANSWER: Pyotr Ilyich **Tchaikovsky**

140-12-55-08130

15. This character claims that "our basest beggars are in the poorest thing superfluous," and he laments another character's death by asking, "Why should a dog, a horse, a rat have life, and thou no breath at all?" He delivers a speech beginning, "Blow, winds, and crack your cheeks!" when he is accompanied into a storm by his fool. This character favors Regan and Goneril for publicly flattering him while banishing his faithful daughter, Cordelia. For 10 points, name this title king of a Shakespearean tragedy.

ANSWER: King **Lear**

014-12-55-08131



1. The speaker of this poem relates “how the chimney-sweeper’s cry every black’ning church appalls; and the hapless soldier’s sigh runs in blood down palace walls.” The speaker claims to hear “the mind-forg’d manacles” in every voice, and this poem ends with the image of the “marriage hearse.” This poem opens, “I wander thro’ each charter’d street, near where the charter’d Thames doth flow.” For 10 points, name this William Blake poem titled for an English city.

ANSWER: “**London**”

014-12-55-08132

2. This state's natural high point at Britton Hill is the lowest of any U.S. state and is topped in height by many buildings. Much of its western border is formed by the Perdido River, while another of its borders partially tracks the Saint Mary's River, and the St. John's River runs through its largest city. Lake Okeechobee is found here, as is the southern portion of the Okefenokee Swamp. For 10 points, name this southern state, the site of the Everglades.

ANSWER: **Florida**

040-12-55-08133

3. This company launched a branded line of "Enterprise Services" after purchasing Ross Perot's company, Electronic Data Systems. In 2010, this company's CEO, Mark Hurd, resigned after an irregular accounting and sexual harassment scandal. Hurd's replacement, Leo Apotheker, was fired in 2011 after proposing that this company sell off its personal computer manufacturing division, and replaced with former gubernatorial candidate and eBay CEO Meg Whitman. For 10 points, name this manufacturer of computers, printers, and other technology products, which also lost value in 2011 after dumping its WebOS-powered Touchpad tablet in a fire sale.

ANSWER: **HP** [or the **Hewlett-Packard** Company]

019-12-55-08134

4. This god blinded the seer Phineus and sent the harpies to prevent him from eating. He assumes the form of an eagle to abduct the boy Ganymede (GAN-ih-meed), and have him serve as cupbearer. He rewards Bacchis and Philemon for their hospitality and turns Io into a cow to avoid detection. This god fathers Helen and Clytemnestra (clit-em-NESS-truh) after taking the form of a swan to seduce Leda. He throws his son Hephaestus (huh-FAY-stus) off of Mount Olympus and has a fully armored Athena emerge from his head. For 10 points, name this husband of Hera, the Greek counterpart of Jupiter and chief of the gods.

ANSWER: **Zeus**

015-12-55-08135

5. Because qubits can hold superpositions of multiple states, Shor's algorithm would allow this procedure to be done in polynomial time. RSA encryption may be intercepted if one is able to perform this procedure with the public key. The simplest method for performing this is trial division, which tests every integer less than the square root of the number in question. For 10 points, name this operation which breaks an integer down into its component primes.

ANSWER: Integer **factorization** [or word forms; or obvious equivalents like “finding prime factors”]

121-12-55-08136

This is a calculation question. An isosceles triangle has a base of 5 opposite a 120 degree angle. What is the length of one of the other sides?

ANSWER: **5/3 times square root of 3** [or **1 and 2/3 times square root of 3**; or **5 square roots of 3 over 3**; or **5 times the square root of 3 all over 3**]

121-12-55-08137

Name this 1967 war in which Israel captured the Gaza Strip, Golan Heights, and West Bank.

ANSWER: **Six-Day** War [or **Third Arab-Israeli** War; or **June** War]

121-12-55-08137