



1. This country's effort to project power by gaining access to more country's ports is called the "string of pearls" strategy. This country produces a little under half the world's solar panels and, for now, has a near-monopoly on rare earth metals. It maintains a trade surplus by undervaluing its currency. The Obama administration's "pivot" has been an attempt to contain this country, which raised a furor in 2012 when an economic rival purchased the Senkaku Islands. For 10 points, name this country that owns about a trillion dollars of the US National debt and is led by Xi Jinping.

ANSWER: People's Republic of **China**

080-13-76-04101

2. One narrator created by this author refers to past incidents such as the "Trevor Richardson affair" and the "Mannering case" and believes that the disappearance of his parents in Shanghai is the cause of the Pacific theater of World War II. This author, who created Christopher Banks in *When We Were Orphans*, also created a protagonist distressed by a housekeeper's long marriage to Mr. Benn. This author depicted the arrival of Mr. Farraday to take over Darlington Hall in that novel about the butler Stevens. For 10 points, name this British author of *The Remains of the Day*.

ANSWER: Kazuo **Ishiguro**

019-13-76-04102

3. This quantity is multiplied by h-bar in the numerator of the Bohr magneton. For its namesake property, quarks have a value of positive two-thirds or negative one-third of this constant. It equals Faraday's constant divided by Avogadro's number. This constant was first measured in an experiment which allowed oil drops to reach terminal velocity, initiated by Millikan. That experiment, which calculated this quantity's ratio to electron mass, set it to be approximately one point six times ten to the negative nineteenth Coulombs. For 10 points, name this value symbolized e.

ANSWER: **elementary charge** [or **charge** of a **proton**; or **charge** of an **electron**]

190-13-76-04103

4. This author wrote a play in which Santa Claus trades masks with Death. Another of his poems considers a man who can "break one two three four five pigeons just like that." That poem ends by asking "how do you like your blue-eyed boy Mister Death" and concerns Buffalo Bill. Another of his poems includes the refrain "sun moon stars rain." He wrote about a "queer old balloonman" who "whistles far and wee" in his poem "in Just." For 10 points, name this author of "anyone lived in a pretty how town" who is known for his unorthodox approach to punctuation and capitalization.

ANSWER: E. E. **Cummings** [or Edward Estlin **Cummings**]

015-13-76-04104

5. This sub-national political division contains a large collection of distance markers at the "Sign Forest" outside of Watson Lake. Herschel Island, which lies just off the northern coast of this political division's mainland, is in the Beaufort Sea. In the southwest of this political division, the Kluane National Park contains a peak of the St. Elias Mountains, Mount Logan. The towns of Burwasli Landing, Sulphur, Forty Mile, and Glacier Creek lie on its western border with the United States. For 10 points, Dawson and Whitehorse are also found within what northwesternmost territory of Canada, which borders Alaska?

ANSWER: **Yukon** [or the **Yukon** Territory]

019-13-76-04105

6. The photochemical reaction that results in the production of this molecule in the atmosphere was elucidated by Sidney Chapman. The concentration of this molecule is most commonly measured in Dobson units. The Montreal Protocol banned certain substances that depleted this molecule in the atmosphere; those substances were chlorofluorocarbons, or CFCs. A layer in the stratosphere that contains a high concentration of this molecule helps protect the Earth from ultraviolet radiation. For 10 points, identify this molecule that consists of three oxygens.

ANSWER: **ozone**

066-13-76-04106

7. This poet got his break when his University of Pennsylvania classmate Ezra Pound convinced James Laughlin to publish him. He wrote a long poem that contains the lines “there is something something urgent I have to say to you” and “it is difficult to get the news from poems.” This author of *Asphodel, That Greeny Flower* wrote another poem about plums that were “delicious, so sweet and so cold.” For 10 points, name this American physician and poet of “This Is Just to Say” and “The Red Wheelbarrow.”

ANSWER: William Carlos **Williams**

015-13-76-04107

8. In his debut game at age twenty in 2003, this man hit a walk-off home run. That year, he also hit a two-run homer off Roger Clemens in Game 4 of the World Series, helping the Florida Marlins to an eventual series win. He was arrested for drunk driving in 2011; earlier, he moved to first base after being traded in 2007 with teammate Dontrelle Willis, but later changed positions again after his team acquired Prince Fielder. He edged out Mike Trout for the most recent AL MVP award. For 10 points, name this Detroit Tigers third baseman, who won the Triple Crown in 2012.

ANSWER: Jose Miguel **Cabrera** Torres

052-13-76-04108

9. This country was home to “Flo,” an animal who was the matriarch of the “F-family.” A mountain here contains a remnant of an icecap called the Furtwangler Glacier. A scientist in this country observed animals creating tools to extract termites from hills and engaging in cannibalism. In its west, Jane Goodall studied chimpanzees at Gombe Stream National Park. This country contains the Serengeti National Park and Africa’s highest peak, Mount Kilimanjaro. For 10 points, name this African country whose largest city is Dar es Salaam.

ANSWER: **Tanzania**

052-13-76-04109

10. The force of Damasithymos of Calyndia was disabled in this battle after it was moved into by the allied force of Artemisia of Halicarnassus. Following defeat in this battle, one side left forces under the command of Mardonius, who was defeated the next year at the Battle of Plataea. Eurybiades had to be convinced to fight this battle rather than retreat. A throne was set up on a hill so that this battle could be watched by Xerxes, whose forces were defeated by Themistocles. For 10 points, name this 480 BCE battle in which Greece defeated the Persian navy.

ANSWER: Battle of **Salamis**

023-13-76-04110

11. This character is first described using the ambiguous word "aglæcwif" (og-LACK-wiff) and is compared, in her rejection of social roles, with the pre-marriage Modthrytho. She is said to have ruled over a court of serpents for a hundred years from her underwater cave. This character is killed with a magical sword, which melts after being used to kill her. This character recovers a severed arm after invading Heorot and is then pursued by her son's Geatish killer. For 10 points, name this second of the three major opponents of Beowulf.

ANSWER: **Grendel's mother** [or **Grendel's dam**; or **Grendles moðor**; do not accept or prompt on "Grendel"]

019-13-76-04111

12. Men involved in the negotiation of this treaty included Johan Adler Salvius and Johann Krane, and the Duke of Mecklenburg ceded Wismar following this agreement. Count Maximilian von Trautmansdorff represented the Holy Roman Empire during the negotiations for this agreement, which consisted of two treaties signed at Munster and Osnabruck. Innocent X's "Zelo domus Dei" condemned this agreement, which reversed Ferdinand II's Edict of Restitution. This agreement re-affirmed the Peace of Augsburg. For 10 points, identify this 1648 treaty which ended the Thirty Years' War.

ANSWER: Peace of **Westphalia**

189-13-76-04112

13. In the voiceover on one of this singer's music videos, she describes how something is "like a kaleidoscope of memories." That song by this singer describes how she heard "from whispers on the street" that a man had "a new notch in [his] belt" and that she's now "lying on the cold hard ground." The music video for another song by this singer shows a band dressed up as woodland creatures and was done in a single continuous take. For 10 points, name this singer whose album *Red* includes the songs "I Knew You Were Trouble" and "We Are Never Ever Getting Back Together."

ANSWER: Taylor Alison **Swift**

023-13-76-04113

14. The Gatteman-Koch reaction produces a compound consisting of this molecule with a formyl substituent. When nitrated, this molecule forms a substance used as a precursor to aniline. A fused pair of this molecule form a substance used in mothballs called naphthalene. A phenyl group has one less hydrogen than this molecule. August Kekule was the first to successfully deduce this molecule's alternating double bond ring structure. For 10 points, name this aromatic hydrocarbon with formula C₆H₆.

ANSWER: **benzene**

201-13-76-04114

15. This character, after failing to thread a needle, is caught pretending to be a girl. Earlier he lies to two men by claiming that his companion was his father and was infected with smallpox. This man's father won custody of him after a new judge overruled Judge Thatcher's decision. This character falsely claims that he is George Jackson when he stumbles upon the Shepherdsons and Grangerfords feud. He misses a turn to Cairo, sending him and the former slave Jim down the Mississippi River. For 10 points, name this protagonist of a Mark Twain novel, who is also friends with Tom Sawyer.

ANSWER: **Huckleberry** Finn [or Huckleberry **Finn**; or **Huck** Finn; or Huck **Finn**]

149-13-76-04115



1A. What director of *Raging Bull* and *Taxi Driver* had his most recent film, *Hugo*, receive the most Oscar nominations in 2012?

ANSWER: Martin Charles **Scorsese**

1B. Name the communications theorist who wrote *The Gutenberg Galaxy* and coined the slogan "the medium is the message."

ANSWER: Marshall **McLuhan**

2A. What functional group contains a nitrogen atom bonded to anywhere from one to four carbon chains?

ANSWER: **amines**

2B. What director's films include *1941*, *The Color Purple* and *Jurassic Park*?

ANSWER: Steven Allan **Spielberg**

3A. Dijkstra's algorithm is an example of what class of algorithms that always takes the locally optimal choice at each stage?

ANSWER: **greedy** algorithm

3B. Which Greek god killed the many-eyed giant Argus and carried a caduceus?

ANSWER: **Hermes**

4A. This is a 20-second calculation question. A certain raffle sells 1000 tickets, each for \$20. One winner is drawn, who will receive \$15,000. What is the expected value of buying a ticket?

ANSWER: **-\$5** [or **lose five** dollars; or equivalent for "lose"]

4B. This is a 20-second calculation question. How many distinct diagonals does a polygon with 14 sides have?

ANSWER: **77**

5A. What number is defined as the square root of negative one?

ANSWER: unit **imaginary** number

5B. What author wrote about the religious experience of John Grimes in *Go Tell It on the Mountain*?

ANSWER: James **Baldwin** [or James Arthur **Baldwin**]

6A. What Russian dramatist wrote *The Seagull* and *Uncle Vanya* and created Madame Ranevskaya in *The Cherry Orchard*?

ANSWER: Anton **Chekhov** [or Anton Pavlovich **Chekhov**]

6B. What Marc Chagall painting shows a cow being milked and a giant green face?

ANSWER: ***I and the Village***

7A. In 1976, what leader of the Viet Minh had his name applied to the city formerly known as Saigon?

ANSWER: **Ho** Chi Minh [or **Nguyen** Sinh Cung; or **Nguyen** Tat Tanh; or **Nguyen** Ai Quoc]

7B. What author who wrote about the Mac-Ivors in *Waverley* also wrote *Rob Roy*?

ANSWER: Walter **Scott**

8A. What medical procedure uses many two-dimensional X-ray images to create a three-dimensional image of the inside of an object, such as one's brain?

ANSWER: **CAT scan** [or **CT scan**; or **computed** axial **tomography**; or **X-ray computed tomography**]

8B. What ballet dancer who founded the White Oak Project was directed by George Balanchine as a member of the New York City Ballet?

ANSWER: Mikhail Nikolaevich **Baryshnikov**

9A. This is a 30-second calculation question. Consider the curve described in parametric coordinates by the two equations $x = t$ over 2 and y equals t squared minus $4t$ minus 5. Find the equation relating y to x .

ANSWER: **y equals $4x$ squared minus $8x$ minus 5** [or **$y = 4x^2 - 8x - 5$**]

9B. This is a 30-second calculation question. What is the angle between the vector " $2i$ plus $6j$ " and the vector " $\text{negative } 3i$ plus j "?

ANSWER: **90** degrees [or **$\pi/2$** radians]

10A. China's claims of the Macclesfield Bank, Paracel Islands, and Spratly Islands are all assigned to what Chinese province, which currently consists of a large island across a namesake straight from Guangdong's Leizhou Peninsula?

ANSWER: **Hainan**

10B. Name the dog that in November 1957 on Sputnik 2 became the first living creature sent into space.

ANSWER: **Laika**



1. The reionization of this element is a major era in the universe's history. The Lyman series occurs in this element. The Rydberg equation is used to find the Balmer series for this element, which is the namesake of an interaction between oxygens and amides in secondary structures of proteins. pH is the measure of the concentration of an ion of this element. It is fused in the proton-proton chain. An explanation for the high boiling point of water is provided by this element's namesake bonds. For 10 points, this lightest element with atomic number one.

ANSWER: **hydrogen**

189-13-76-04117

2. This poet wrote that "today the Roman and his trouble are ashes under Uricon" in one poem, and he wrote that "the lad who runs away lives to die another day" in another poem. This poet wrote of a tree "hung with bloom along the bough" in his poem beginning, "Loveliest of trees, the cherry now." He also wrote a poem in which the laurel "withers quicker than the rose," his "To an Athlete Dying Young." For 10 points, identify this Latin scholar and British poet known for his collection *A Shropshire Lad*.

ANSWER: A. E. **Housman**

126-13-76-04118

3. This principle can be mathematically modeled by the Moran model and the Wright-Fisher model, the latter of which is named for its originator, Sewall Wright. This principle generally only results in minor changes according to the Hardy-Weinberg principle, and it is especially likely to happen if an event results in a population bottleneck. Small populations are especially sensitive to a special case of this principle called the founder effect. For 10 points, name this general term for the change in frequency of an allele in a population over time.

ANSWER: **genetic drift** [prompt on **founder effect** until mentioned]

052-13-76-04119

4. In ancient Greek, this type of sentence uses one of two conjunctions, "ei" or "ean." These constructions generally consist of a "protasis" and an "apodosis." Spanish has a special tense for verbs used in these constructions which is formed by adding "-ia" to the infinitive, as in "hablaria." In Latin, types of these constructions include "future more vivid" and "past contrary-to-fact." For 10 points, name this type of sentence exemplified in English by the statement "If you build it, they will come."

ANSWER: **conditional** sentences [or **if-then** statements]

080-13-76-04120

5. This President won an election in which his opponent dismissed a tariff as being "a local question." Stephen Dorsey and Thomas Brady were implicated in an investigation by this man's Postmaster General, Thomas James, during the Star Route Scandal. This man defeated Winfield Scott Hancock in his only election bid. An attack on this President in a station of the Baltimore and Potomac Railroad led his successor to pass the Pendleton Act. For 10 points, identify this President who was assassinated by Charles Guiteau.

ANSWER: James Abram **Garfield**

189-13-76-04121

6. This character's father is the wealthy student Felix Tholomyes. She is educated in the Petit-Picpus convent after being helped by its gardener Fauchelevent, who wears a bell on his leg. As a young girl, this orphan is saved from doing hard labor at an inn for the Thenardiers. After the death of Eponine, she marries Marius Pontmercy. She grows up while hiding with her adopted father from the relentless Inspector Javert. For 10 points, name this young ward of Jean Valjean in Victor Hugo's novel *Les Miserables*.

ANSWER: Cosette

015-13-76-04122

7. This object's north is home to the Arabia Terra region, considered to be one its oldest terrains. An enormous impact on this object created a feature that covers nearly 40% of its surface, the Borealis Basin. A continent-size uplifted region in the southern hemisphere of this object is known as the Tharsis bulge. Giovanni Schiaparelli theorized that there were "canals" on this object. The rover *Curiosity* is exploring this object. It is the site of the mountain Olympus Mons and has two moons, Phobos and Deimos. For 10 points, name this fourth planet from the Sun, known as the "Red Planet."

ANSWER: Mars

052-13-76-04123

8. The applicability of this law to the states was tested in the 2010 Supreme Court case *McDonald v. Chicago*. That case followed a similar 2008 ruling on this law in *District of Columbia v. Heller*. Alex Jones started a petition to the White House to deport a television personality because of an attack on this law. Jones claimed during an interview with Piers Morgan that "1776 will commence again" if the rights of this law were violated. For 10 points, name this part of the Bill of Rights that grants citizens the right "to keep and bear arms."

ANSWER: Second Amendment to the United States Constitution

023-13-76-04124

9. In some organisms, this organelle possesses a structure called a pyrenoid, which regulates diffusion. Another structure in this organelle contains the cytochrome b6f complex. This organelle contains the TIC and TOC translocases. Lamellae connect the grana within this organelle, and the stroma is the fluid which surrounds thylakoids in this organelle. The aforementioned stroma is the site of the Calvin cycle in this organelle, which is found in photosynthetic organisms. For 10 points, identify this organelle whose color comes from its chlorophyll.

ANSWER: chloroplasts

189-13-76-04125

10. Owen Roberts headed a commission to investigate this event, which resulted in the dismissal of Walter Short and Husband E. Kimmel. It took place several days after Cordell Hull delivered a note to one country's government. This event was triggered by the code phrase "Climb Mount Niitaka" and reportedly led to a quote about waking a "sleeping giant" delivered by Admiral Yamamoto. This event is commemorated by the U.S.S. *Arizona* memorial. For 10 points, name this attack on a Hawaiian naval base by Japanese forces on December 7, 1941.

ANSWER: attack on Pearl Harbor [or Operation Z]

052-13-76-04126

11. One of the earliest structures of this kind was excavated at Dura-Europos. The Vikings constructed "stave" ones and Ethiopians built many rock-hewn ones. The Cenacle, or the Upper Room, is often touted as the first one. In these buildings, several aisles all meet up at a nave, the central approach to the front. Roman marketplaces and courthouses provided the model for a specific type of these buildings, known as basilicas. The lectern and pulpit are stands that may be found in these buildings. For 10 points, a cathedral is a specific type of what buildings, Christian places of worship?

ANSWER: churches [or abbeys; or basilicas until it is read; or house churches; or cathedrals until it is read]

020-13-76-04127

12. The author of this novel borrowed a description of the Pharisees from the Bible to describe one city as a "whited sepulchre." An essay written about novel criticizes the portrayal of a man shouting, "Eat 'im!" and asserts that the author was fixated on the "n-word." Chinua Achebe called the author of this novel a racist in his essay "An Image of Africa." In this novel, Mr. Kurtz dies in the presence of the British sailor Marlow. For 10 points, name this short novel by Joseph Conrad.

ANSWER: Heart of Darkness

190-13-76-04128

13. This god is the father of a being who runs a court of justice at Glitnir. His death was avenged by Vali, who grew to adulthood in one day to slay this god's murderer. This god owns a hall named Breidablik. At his funeral, his wife, Nanna, threw herself on the funeral pyre. This being was killed by his own brother, the blind Hoder. This god would have been released from the underworld, but Loki disguised himself as a giantess and refused to cry. For 10 points, name this Norse god killed by the one object that could slay him, mistletoe.

ANSWER: Balder

052-13-76-04129

14. One piece by this man contains a slow trombone passage in A flat minor and a mysterious "Molto piu moderato" movement. A misattributed Saint Anthony theme is used in this man's *Variations on a Theme by Haydn*. One of this composer's symphonies uses an alhorn theme in its last movement; he replied "any ass can see that" when Hans von Bulow nicknamed that *First Symphony* by this man "Beethoven's Tenth." For 10 points, name this German classical composer of the *Tragic Overture*, who wrote a lied (lead) that is a commonly-sung lullaby.

ANSWER: Johannes Brahms

023-13-76-04130

15. This man's namesake theorem gives the radius of a fourth circle which is tangent to three other mutually tangent circles. An operation which gives all possible pairs from two sets is called his namesake "product." The number of positive roots of a polynomial has the same parity as the number of sign changes of the polynomial's coefficients according to his "rule of signs." This man's best-known mathematical achievement is extended to three dimensions with the inclusion of a z-axis, and is centered at the origin. For 10 points, name this mathematician who formulated a rectangular coordinate system.

ANSWER: Rene Descartes

190-13-76-04131



1. This scientist invented an analog computer called the Monte Carlo trolley in order to facilitate his studies of neutron transport, and charged particles reflected off a magnetic mirror undergo his namesake acceleration. Perturbation theory uses his "golden rule." A facility named for him is the location of the DZero and CDF experiments, which discovered the top quark in 1995. That facility, which is home to the Tevatron particle accelerator, is located in Batavia, Illinois. Particles named for this man have half-integer spin and include leptons and quarks. For 10 points, identify this Italian-American physicist.

ANSWER: Enrico **Fermi**

189-13-76-04132

2. Mario Vargas Llosa wrote a "retelling" of this man's most famous novel entitled *Bad Girl*. The veil of Tanit is stolen by Matho in this man's novel *Salammbô*. After moving to Yonville, a character in a novel by this man borrows money from Lheureux and gives birth to Berthe. In that novel by this man, the protagonist's husband botches an experimental surgery on the club-footed boy Hippolyte. That protagonist has affairs with Leon Dupuis and Rodolphe Boulanger. For 10 points, name this French author of *Madame Bovary*.

ANSWER: Gustave **Flaubert**

149-13-76-04133

3. A Boltzmann factor is the reciprocal of the product of Boltzmann's constant and this quantity. When this quantity is held constant in a process, the work done is proportional to the logarithm of the ratio of the volumes. Although it's not heat, the efficiency of a heat engine equals one minus the ratio of this quantity for the reservoirs. In the expression for Gibbs free energy, entropy is multiplied by this quantity. Average kinetic energy of a gas is proportional to this quantity, which can be measured on the Rankine scale. For 10 points, name this quantity also measured in Kelvins or degrees Fahrenheit.

ANSWER: **temperature** [or **T**]

190-13-76-04134

4. Abacuk Prickett gave the only extant narrative of this man's final voyage. This man's grandfather was one of the founders of the Muscovy Company, and that company sponsored this man's journey to the Russian Arctic. This explorer sailed on the *Half Moon* on a voyage in which he claimed what is now New Amsterdam. This man's expedition on the *Discovery* ended in a mutiny that killed him and his son, but which failed to find a Northwest Passage. For 10 points, name this English explorer who sailed for the Dutch and for whom a New York river and Canadian bay are named.

ANSWER: Henry **Hudson**

190-13-76-04135

5. *N. equitans* is the only organism in one phylum of this taxon. Carl Woese first identified and classified this group of organisms. Organisms in this taxon have ether, rather than ester bonds, to fatty acids, and their fatty acids are branched. They have pseudomurein, rather than peptidoglycan, in their cell walls. Halophiles and methanogens are categorized into this taxon, which also contains a group of organisms which can live in hot springs. This prokaryotic domain was separated from Bacteria in 1977. For 10 points, name this group of unicellular extremophile organisms.

ANSWER: **Archaea**

190-13-76-04136

Name the man who was helped by Robert Kennedy in becoming the first African-American student at the University of Mississippi in 1962.

ANSWER: James **Meredith**

This is a calculation question. Calculate the tangent of 225 degrees.

ANSWER: **1**