



1. Secondary battles to the south of this battle included Ligny and Quatre-Bras. Marshall Ney led the final assault in this battle, and the late arrival of Prussian forces under Gebhard von Blucher contributed to the Duke of Wellington's victory in this battle. For 15 points, name this 1815 battle in Belgium that saw the final military defeat of Napoleon Bonaparte.

ANSWER: Battle of Waterloo

030-13-104-10101

BONUS: This is a 20-second calculation question. The altitude of a right triangle from the hypotenuse to the right angle bisects the right angle and has length one unit. What is the length of the hypotenuse?

ANSWER: 2 units

121-13-104-1010-11

2. Symbols in this writing system that have developed native meanings are known as "Kokku" (COH-koo). The two ways to read this system's normal symbols are called "on-yomi" (AHN-yoh-mee) and "kun-yomi" (KUN-yoh-mee). This system is ideogrammatic, rather than representing words or syllables, and its name literally means "Han characters," reflecting its origin. This one of at least three writing systems for Japanese consists of symbols based on Chinese characters. For 15 points, identify this writing system that is not hiragana (HEER-uh-gah-nuh) or katakana (KAH-tuh-kah-nuh).

ANSWER: Kanji [prompt on Japanese until "on-yomi" is read]

147-13-104-10102

BONUS: This is a 20-second calculation question. If  $P$  of  $x$  is a polynomial of degree 2 and  $Q$  of  $x$  is a polynomial of degree 3, what is the degree of the composition function,  $P$  of  $Q$  of  $x$ ?

ANSWER: 6

233-13-104-1010-11

3. In physics, this phenomenon is described using Faraday's law; it refers to the creation of an emf when the magnetic flux through a circuit changes. This term can also refer to the redistribution of electric charge in a neutral object when a charged object is brought near it. In mathematics, it refers to a type of proof in which a statement is assumed true for a number  $n$  and then shown to be true for an integer  $n$  plus one. For 15 points, identify this term that names a form of reasoning contrasted with deductive reasoning.

ANSWER: induction [or word forms; or specific types, such as electrostatic or electromagnetic or mathematical induction]

226-13-104-10103

BONUS: What poem by William Butler Yeats ends with the speaker wondering "what rough beast... Slouches towards Bethlehem to be born?"

ANSWER: "The Second Coming"

227-13-104-1010-11

4. Spacecraft specifically investigating these phenomena include Hinode (HE-node-ay), Yohkoh, and RHESSI (RESS-ee). Nitrates and beryllium-10 persist in Greenland from an 1859 example of these phenomena called the Carrington event. They are classified as A, B, C, M, X, or Z depending on the peak flux. These events are similar to coronal mass ejections, and they can trigger geomagnetic storms with the potential to knock out power. For 15 points, name these events in which a large amount of energy enters the Earth's ionosphere, after being discharged from the Sun.

ANSWER: **solar flares** [or **coronal mass ejections** until it is read; or **CME** until "coronal mass ejections" is read; or **geomagnetic storms** until it is read; prompt on **flares**]

020-13-104-10104

BONUS: What set of problems in mathematics and physics, including the "P versus NP problem," were stated in 2000 and can result in a one million dollar prize to anyone who solves them?

ANSWER: **Millennium Prize** Problems

052-13-104-1010-11

5. This thinker posited that material, formal, efficient, and final causes were present in all things. He claimed that the only non-material form was the "Prime Mover." This man suggested that "eudaemonia" could be found by pursuing moderation in a manual named after his son, the *Nichomachean Ethics*. For 15 points, name this tutor of Alexander the Great and most influential philosopher of Classical Greece, who wrote the *Politics* and *Poetics*.

ANSWER: **Aristotle**

019-13-104-10105

BONUS: What kind of self-similar mathematical set is exemplified by the Sierpinski Triangle, Koch Snowflake, and the Mandelbrot Set?

ANSWER: **fractal**

153-13-104-1010-11

6. This man was the closest collaborator with the librettist Lorenzo Da Ponte. In one of his operas, a maid is serenaded with a mandolin by a window and the title character commands his servant to gather girls for a party in the "Champagne Aria." The maid Susanna assists the title character in rekindling Count Almaviva's love for Rosina in another opera by this man, the sequel to *The Barber of Seville*. For 15 points, name this composer of the operas *Don Giovanni* and *The Marriage of Figaro*.

ANSWER: Wolfgang Amadeus **Mozart** [or Johannes Chrysostomus Wolfgangus Theophilus **Mozart**]

020-13-104-10106

BONUS: Name the inventor who revolutionized an American industry with his 1793 creation of the cotton gin.

ANSWER: Eli **Whitney**

023-13-104-1010-11

7. A king of this name reigned for forty-five days before being killed by one of his father's concubines in a drunken stupor. Another king of this name attempted to build the Hall of a Hundred Columns and ordered the construction of the Gate of All Nations, and was ultimately betrayed by his minister Artabanus (art-uh-BAA-nus). That king of this name led his forces to defeat in the Battle of Plataea (pluh-TAY-uh) after building a pontoon bridge. For 15 points, give this name of a Persian emperor who led his troops at Thermopylae (thur-MAH-puh-lye).

ANSWER: **Xerxes** (ZERK-seez)

030-13-104-10107

BONUS: This is a 20-second calculation question. What is the volume of the largest sphere that will fit completely inside a rectangular prism of height 4 units, width 5 units, and depth 8 units?

ANSWER: **32 pi over 3** cubic units [or **32/3** times **pi** cubic units]

003-13-104-1010-11

8. This man championed the "Planning, Programming, and Budgeting System" which brought computer-based systems analysis to the federal government for the first time. He was one of the "Whiz Kids" for Ford before becoming that company's president, and he was later the president of the World Bank from 1968 to 1981. While serving under Lyndon Johnson and John Kennedy, he made decisions that he later expressed regret for in the documentary *The Fog of War*. For 15 points, name this Secretary of Defense during the escalation of the Vietnam War.

ANSWER: Robert Strange **McNamara**

088-13-104-10108

BONUS: Which Emperor of Japan delivered the "Jewel Voice Broadcast" to explain Japan's decision to surrender to the Allies and end World War II?

ANSWER: **Hirohito** [or **Showa** Emperor]

186-13-104-1010-11

9. 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 15 points, name this Supreme Court Chief Justice who presided over *Marbury v. Madison*.

ANSWER: John **Marshall**

190-13-104-10109

BONUS: Name the Gabriel Garcia Marquez novel following the Buendia (bwen-DEE-uh) family in Macondo.

ANSWER: **One Hundred Years of Solitude** [or **Cien Anos de Soledad**]

014-13-104-1010-11

10. This poet's lines, "Thou mastering me God! giver of breath and bread," open his poem dedicated to nuns lost in the sinking of a ship. He wrote, "There lives the dearest freshness deep down things," in another poem. Much of this poet's characteristic style imitates the alliterative-accentual verse of Old English, which he termed "sprung rhythm," as seen in "The Wreck of the Deutschland." For 15 points, name this Jesuit poet of "God's Grandeur" and "The Windhover."

ANSWER: Gerard Manley **Hopkins**

121-13-104-10110

BONUS: What object was given by Death to Ignotus Peverell according to the Tale of the Three Brothers?

ANSWER: Harry Potter's **Invisibility Cloak**

190-13-104-1010-11

11. Humphry Davy first isolated this element from lime and mercuric oxide in 1808. Portland cement is comprised almost entirely of this element's silicates and aluminates. Gypsum contains this element and sulfate, while apatite contains this element's phosphate. This element's carbonate appears in shells, marble, and chalk. For 15 points, name this alkaline earth metal whose mineralized form makes up bones and teeth.

ANSWER: **calcium**

239-13-104-10111

BONUS: *King Lear* includes a famous example of what type of stock character from Elizabethan drama, who often speaks in a witty and humorous manner?

ANSWER: **fool** [or **clown**]

014-13-104-1010-11

12. In a play by this man, the title character uses Bajazeth (BAH-juh-zeth) as a footstool and woos Zenocrate (zee-NAH-kruh-tay). This playwright wrote a prologue spoken by Machiavel in a play where the title character has his servant Ithamore deliver poisoned porridge to his daughter Abigail's convent. This author of *Tamburlaine the Great* wrote an influential play about a scholar who sells his soul to Mephistophilis. For 15 points, name this Elizabethan playwright of *The Jew of Malta* and *Doctor Faustus*.

ANSWER: Christopher **Marlowe**

186-13-104-10112

BONUS: Name the Polish-born composer who wrote the "Revolutionary" and "Black Key" etudes.

ANSWER: Frederic Francois **Chopin** [or Fryderyk Franciszek **Szopen**]

023-13-104-1010-11

13. In a novel by this author, Kamala dies after being bitten by a snake near the river. In that novel, the protagonists' friend Govinda becomes a follower of Gotama. In a novel by this author, the saxophonist Pablo brings the protagonist to the Magic Theatre. That protagonist, Harry Haller, then kills Hermine. For 15 points, name this German author of *Siddhartha* and *Steppenwolf*.

ANSWER: Hermann **Hesse**

186-13-104-10113

BONUS: What instrument did the jazz musician Louis Armstrong play?

ANSWER: **trumpet** [or **cornet**]

052-13-104-1010-11

14. In such books as *Dragon's Teeth*, this author chronicled the adventures of Lanny Budd. In one of his novels, the protagonist attacks factory boss Phil Connor for raping his wife, Ona. This author created a character who eventually embraces Socialism and is a Lithuanian immigrant in Chicago named Jurgis Rudkus. That book by this man inspired the passage of the Pure Food and Drug Act due to its exposure of the meatpacking industry. For 15 points, name this author of *The Jungle*.

ANSWER: Upton Beall **Sinclair** Jr.

052-13-104-10114

BONUS: What geologic period is named for a mountain range on the French-Swiss border, was dominated by sauropods, and came after the Triassic?

ANSWER: **Jurassic** period

228-13-104-1010-11

15. 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 15 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***]

227-13-104-10115

BONUS: What grammatical case is used in German for subjects such as "ich" and "du?"

ANSWER: **nominative** case

023-13-104-1010-11

16. Scott Sakaluk studied the chase-away form of this process, whose runaway form was proposed by Fisher, and confirmed by Kirkpatrick and Lande, when high genetic covariance was present. Bateman's principle states that it is dependent on gamete investment. Bowerbirds build elaborate structures in this process, which is prevalent in polygynous (pall-IDGE-in-iss) societies. Male-male competition and female choice are the two main forms of this process. For 15 points, name this process in which organisms compete for and choose mates, which can be thought of as a special case of natural selection.

ANSWER: **sexual** selection [prompt on natural **selection**]

124-13-104-10116

BONUS: According to VSEPR, what is the molecular geometry has bond angles of one hundred and nine point five degrees?

ANSWER: **tetrahedral**

239-13-104-1010-11

17. In this novel, the protagonist befriends Platon Karataev, a captured peasant who is later executed after developing a fever. The narration of this novel is often interrupted to discuss the author's deterministic theory of history. A character in this novel tries to assassinate a world leader after witnessing the Battle of Borodino. At the end of this novel, Pierre Bezukov marries Natasha Rostov. For 15 points, name this novel by Leo Tolstoy that is set during Napoleon's invasion of Russia.

ANSWER: ***War and Peace*** [or ***Voyna i mir***]

186-13-104-10117

BONUS: This is a 30-second calculation question. If Tom can paint a whole fence in 3 hours, and Huck can paint one in 6 hours, then how many MINUTES would it take if they painted it together, assuming each works at a constant rate?

ANSWER: **120** minutes [do not accept "2"]

233-13-104-1010-11

18. Fifty-one stories of this type were written by John Gay for the future Duke of Cumberland. More than seven hundred stories of this type were collected into a book by Ben Edwin Perry. Twelve books filled with this kind of story were written by Jean de La Fontaine. These stories are generally followed by a maxim, and their use of anthropomorphism differentiates them from parables. For 15 points, name this type of story, exemplified by the mouse saving a trapped lion and the hare losing a race to a tortoise, as told by Aesop.

ANSWER: **fables**

023-13-104-10118

BONUS: What female photographer captured the spirit of the Great Depression in her image *Migrant Mother*?

ANSWER: Dorothea **Lange**

052-13-104-1010-11

19. Edouard Lalo wrote one of these pieces in five movements for Pablo de Sarasate called the *Symphonie Espagnole*. A set of these compositions includes one that uses rapid pizzicato to depict freezing winds and another whose second movement depicts a barking dog. Those four pieces, collected in *The Contest Between Harmony and Invention*, make up Antonio Vivaldi's *Four Seasons*. For 15 points, name these pieces for a solo string instrument playing against an orchestra.

ANSWER: **violin concertos** [or **violin concerti**; prompt on **concerto**]

080-13-104-10119

BONUS: Name the two rivers that combine into the Shatt al-Arab and surrounded the Cradle of Civilization in ancient Mesopotamia.

ANSWER: **Tigris** and **Euphrates** [either order correct, but do not accept or prompt if only one answer is given]

023-13-104-1010-11

20. The Betawi people are descended from residents of this city, which is home to a mosque named after the Arabic word for "independence," Istiqlal. The government of this city also administers the Thousand Islands. The streets of this city are home to a fried rice dish called Nasi Goreng. The Dutch East India company operated out of this city when it was called Batavia. This city is the most populous in Southeast Asia. For 15 points, name this largest city on Java, the capital of Indonesia.

ANSWER: **Jakarta**

080-13-104-10120

BONUS: What animal phylum is comprised of flatworms?

ANSWER: **Platyhelminthes**

014-13-104-1010-11

21. This poet wrote "I began to talk like a Jew, I think I may well be a Jew" in a poem which describes the title character as having a "neat mustache" and an "Aryan eye." She created a woman who struggles with depression and undergoes electroshock therapy; that character is named Esther Greenwood. The first wife of Ted Hughes, this poet killed herself in 1963. For 15 points, name this female author of such poems as "Daddy" and the novel *The Bell Jar*.

ANSWER: Sylvia **Plath**

052-13-104-10121

BONUS: This is a calculation question. If the tangent squared of x is equal to 0.7, what is the secant squared of x?

ANSWER: **1.7**

080-13-104-1010-11

22. Towards the end of this book, the protagonist becomes the first black streetcar conductor in San Francisco before trying to get pregnant to prove to herself that she is not a lesbian. That protagonist, who makes friends with Louise Kendricks, is raped by Mr. Freeman but inspired to write by Bertha Flowers. This book begins with the protagonist and her brother Bailey moving to Stamps, Arkansas to live with their grandmother. For 15 points, name this autobiography by Maya Angelou.

ANSWER: ***I Know Why the Caged Bird Sings***

192-13-104-10122

BONUS: This is a 20-second calculation question. Consider a deck of 24 cards consisting only of twos through sevens in each of the four suits. What is the probability that the top two cards in the deck sum to nine?

ANSWER: **4/23**

003-13-104-1010-11

23. Suriname is home to one of these constructs called Sranan. Another of these constructs is most common among the Geechee people on the Sea Islands off of South Carolina and Georgia. Exemplified by Jamaican Patois and Gullah, these constructs develop when a child adopts the Pidgin of their parents as a native language. For 15 points, give this term for a language mixed from two parent languages, as exemplified by the mixture of French and African tongues in Louisiana.

ANSWER: **Creole** languages [prompt on **languages**; prompt on **Pidgins** until it is read]

080-13-104-10123

BONUS: Besides Sinhala, what is the official language of Sri Lanka, a tongue that also partly names a Sri Lankan separatist group?

ANSWER: **Tamil**

052-13-104-1010-11

24. This man headed a federal commission on water quality and twice defeated Socialist Labor candidate Eric Hass. He rose to his executive position by defeating millionaire W. Averell Harriman. This man passed a series of namesake tough drug laws and once raised his middle finger at a reporter on the campaign trail. He controversially married a divorcee named "Happy" and stated "that's life" after thirty-nine people died in the Attica prison riots. For 15 points, name this governor of New York and Vice President under Gerald Ford, who was the grandson of John D.

ANSWER: Nelson **Rockefeller**

048-13-104-10124

BONUS: "The Lives of the Dead" is one of the stories from what collection by Tim O'Brien about a group of American soldiers in Vietnam?

ANSWER: *The **Things They Carried***

014-13-104-1010-11

25. The enzyme named after these things is absent in Cri du chat (CREE do sha) syndrome and was discovered in *Tetrahymena*. That enzyme, hTERT, adds TTAGGG to the ends of these things in humans, similar to what occurs in cancer cells. These things are subject to the end replication problem, and when very short, they lead to cellular senescence (suh-NESS-unce). The discovery of these things by Elizabeth Blackburn explained Leonard Hayflick's theory that cells could only divide a finite number of times. For 15 points, identify these series of repeating nucleotides at the ends of chromosomes.

ANSWER: **telomeres**

233-13-104-10125

00--20-1010-11

26. This man's siblings include a doctor known as "Uncle Jack" and a woman known as "Aunt Alexandra." He employs a housekeeper named Calpurnia. This character, who is known as "One Shot," demonstrates his shooting skill by killing a rabid dog. He defends the black Tom Robinson, who has been accused of raping a white woman. This widower is the father of Jem and Scout. For 15 points, name this lawyer, the protagonist of Harper Lee's book *To Kill a Mockingbird*.

ANSWER: **Atticus** Finch [or **Finch**]

052-13-104-10126

00--20-1010-11



27. In C, the keyword `typedef` can be used to create new objects for use in this operation. Global and local scope is determined by whether this operation is performed outside of all functions or inside a function. Statically typed languages without type interference must include the type of a variable or function when performing this operation. For 15 points, identify this operation that must be done before a function or variable is used, in which they are defined.

ANSWER: **declaration** [or word forms, such as **declare**; prompt on **definitions**]

066-13-104-10127

00--20-1010-11

28. The tat protein in HIV patients greatly increases the rate of this process, which is also enhanced in the presence of acetyl transferases. Although not methylation, this process is initiated from CpG islands in some eukaryotes. This process does not occur from Barr bodies because they have been highly methylated. The product of this process is capped with methyl-guanosine and gets a poly-A tail. Retroviruses can do this process in reverse. This process is initiated at a promoter and is mostly catalyzed by RNA polymerase. For 15 points, name this process of making messenger RNAs from DNA.

ANSWER: **transcription** [do not accept "translation"]

190-13-104-10128