



1. This character dies at the siege of Maastricht after learning of his promotion to Marshal of France. In a crucial scene, this character recalls seeing a certain woman in Meung, thus identifying her as an enemy agent. This character dies at the end of *The Vicomte of Bragelonne*, and he is revenged for the poisoning of his love Constance when he arranges the execution of Milady de Winter. For 15 points, name this character who joins Porthos, Athos, and Aramis in Alexandre Dumas's *The Three Musketeers*.

ANSWER: **d'Artagnan** (dar-TAHN-yihn)

014-12-85-13101

BONUS: Identify the southwestern state of Australia which lies across the Bass Strait from Tanzania, contains Melbourne, and is named for a monarch.

ANSWER: **Victoria**

019-12-85-1310-1

2. One law named for this man corrected for the fact that classical models of black bodies predict infinite energy at short wavelengths. The de Broglie wavelength is equal to this man's constant divided by linear momentum. He posited that electromagnetic energy could only be transmitted in multiples of the frequency times his namesake constant, symbolized h. For 15 points, name this German physicist whose constant is equal to approximately 6.62 times 10 to the minus 34 Joule-seconds.

ANSWER: Max Karl Ernst Ludwig **Planck**

048-12-85-13102

BONUS: What operation, when applied to two sets, yields a new set that contains all the elements in both of the input sets?

ANSWER: **union**

132-12-85-1310-1

3. This race was born from the union of Ixion and the cloud Semele, which had been given the form of Hera by Zeus. Some of them abducted Hippodamia on her wedding day, causing Pirithous and Theseus to fight them. That scene, and other depictions of their war with the Lapiths were depicted in the frieze of the Parthenon. The most famous member of this race was the teacher of Achilles. For 15 points, Chiron was an example of what half-horse half-man race from Greek mythology?

ANSWER: **centaurs**

015-12-85-13103

BONUS: What Serbian-American physicist invented the radio and names the SI unit of magnetic flux density?

ANSWER: Nikola **Tesla**

066-12-85-1310-1

4. In November 2010, this team scored 54 points in the second quarter against the Denver Nuggets, winning the game 144 to 113. In the 2012 offseason, this team acquired Ian Mahimni from the Dallas Mavericks for Darren Collison and Dahntay Jones and Kevin Pritchard replaced David Morway as general manager. After a season in which this team lost to the Miami Heat in the Eastern Conference semifinals, two former players were inducted into the Basketball Hall of Fame. For 15 points, name this NBA Eastern Conference team, whose 2012 Hall of Fame inductees were ABA star Mel Daniels and NBA star Reggie Miller.

ANSWER: Indiana **Pacers** [or **Indiana** Pacers]

194-12-85-13104

BONUS: Octavia Spencer won an Oscar for playing Minny Jackson in what 2011 movie documenting the lives of Mississippi domestic workers?

ANSWER: **The Help**

030-12-85-1310-1

5. The narrator of this poem stands “deep into the darkness peering” and “dreaming dreams no mortals ever dared to dream before.” That narrator is affected by the “silken sad uncertain rustling of each purple curtain” in his room, which contains a “pallid bust of Pallas.” This poem takes place “once upon a midnight dreary,” and features a narrator mourning his lost Lenore. For 15 points, name this poem in which an “ebony bird” repeats the word “nevermore,” a work of Edgar Allan Poe.

ANSWER: “The **Raven**”

015-12-85-13105

BONUS: What tropical disease, once treated by quinine and DDT, is transmitted by the *Plasmodium* protest via mosquitos?

ANSWER: **malaria**

104-12-85-1310-1

6. This city is named for a Duwamish chieftain who apocryphally gave a speech asking "how can you buy or sell the sky?" Militant anti-globalization protesters forced the World Trade Organization to end its 1999 conference in this city early. Boeing was founded in this city, which is the headquarters for Nordstrom, Amazon, and Starbucks. For 15 points, name this center of the grunge music scene in the 1990s whose Century 21 Expo featured the Space Needle.

ANSWER: **Seattle**

015-12-85-13106

BONUS: What scientist restructured the periodic table by moving the lanthanides and actinides below the main body?

ANSWER: Glenn **Seaborg**

048-12-85-1310-1

7. Heterogenous varieties of these substances commonly require a support, and one type of them uses phase transfer. These substances may be "poisoned" to make them more selective. One example of these substances consists principally of iron and functions by allowing gases to adsorb to its surface. Metals like palladium and nickel usually serves as these species in hydrogenation reactions. In general, these substances lower the activation energy for a reaction, but aren't consumed in the process. For 15 points, name these substances which speed up the rate of chemical reactions.

ANSWER: **catalysts**

190-12-85-13107

BONUS: Name the British poet who wrote "To a Skylark" and "Ode to the West Wind."

ANSWER: Percy Bysshe **Shelley**

019-12-85-1310-1

8. This artist tried to downplay his youthful apprenticeship to Ghirlandaio. He painted a self-portrait as the flayed St. Bartholomew in his fresco of *The Last Judgment*. In one of his paintings, the outstretched hand of Adam nearly touches the index finger of a reaching God. That fresco, *The Creation of Adam*, is the most famous of the paintings this artist did for the ceiling of the Sistine Chapel. For 15 points, name this Renaissance artist who also sculpted a marble *David*.

ANSWER: **Michelangelo**

015-12-85-13108

BONUS: What Greek hero rescued Andromeda from a sea monster and was the son of Zeus, who impregnated his mother in the form of a shower of gold?

ANSWER: **Perseus**

052-12-85-1310-1

9. A crucial event in the independence of this country was the defeat of Leopold I and his Austrians at Morgarten Pass in 1315. This country was known as Helvetica by the ancient Romans. A group of "guards" from this country have historically protected the Pope. Huldrych Zwingli led the reformation of Zurich in this country. For 15 points, name this European country composed of regions called "cantons" that has maintained its policy of neutrality since 1815.

ANSWER: **Switzerland** [or **Swiss Confederation**; or **Schweizerische Eidgenossenschaft**; or Confederation **Suisse**; or Confederazione **Svizzera**; or Confederaziun **Svizra**]

015-12-85-13109

BONUS: This is a 30-second calculation question. Give the zeroes of the function $f(x) = x^3 + 2x^2 - 4x - 8$.

ANSWER: $x = \underline{2}$ and $x = \underline{-2}$ [or $x = \underline{2}$, $x = \underline{-2}$, and $x = \underline{-2}$]

080-12-85-1310-1

10. In one work in this literary genre, Kriemhild has a prophetic dream of a falcon being torn apart by eagles. This genre is characterized by the use of complex extended similes. In the aforementioned example of this genre, bathing in the blood of a dragon renders Siegfried nearly invincible. In addition to the *Nibelungenlied* (nee-buh-LUNG-ehn-leet), another example of this genre opens by invoking the Muse to tell what caused the feud between Agamemnon and Achilles. For 15 points, name this genre of narrative poems, ancient examples of which include the *Iliad*.

ANSWER: **epic** poems [or **epics**]

014-12-85-13110

BONUS: Every Shostakovich symphony but the fourteenth includes what largest, lowest-pitched brass instrument?

ANSWER: **tuba**

195-12-85-1310-1

11. This empire's decline was marked by the Tuareg seizure of Walata. This empire, which developed from the state of Kangaba, started after the defeat at the Battle of Kirina of the Susu chief Sumanguru. The empire's most powerful ruler patronized Egyptian scholars and embarked on a lavish pilgrimage to Mecca. Famously ruled by Mansa Musa, this empire was founded by Sundiata Keita. For 15 points, name this African trading empire that in the fourteenth century absorbed the cities of Gao and Timbuktu.

ANSWER: **Mali** Empire

014-12-85-13111

BONUS: Independence, Overland Park, Lee's Summit, and Shawnee are suburbs of what city, where the Google Fiber project, offering free, ultra-high-speed Internet access covering most of the city, began construction in September 2012?

ANSWER: **Kansas City**, Missouri

019-12-85-1310-1

12. This contest's logo has a heart that is filled in based on who is the host. The 2012 winning submission, "Euphoria", got more first-place votes than the highest scoring winning submission in the history of this contest, Alexander Rybak's "Fairytale" that won in 2009. Celine Dion and ABBA have both won this contest in which national broadcasters win hosting rights for the following year if their contestant wins. For 15 points, name this annual song contest held by the European Broadcasting Union.

ANSWER: **Eurovision** Song Contest [or *Concours Eurovision de la Chanson*]

153-12-85-13112

BONUS: This is a 20-second calculation question. If the length of each side of a triangle is tripled, how many times greater will the area be?

ANSWER: **9** times greater

197-12-85-1310-1

13. These events are responsible for r-process nucleosynthesis. Perlmutter's observation of these events was used to show that the expansion of the universe is accelerating. One type of these events occurs after a core-collapse, while another type occurs when the Chandrasekhar (shan-druh-SAY-kar) limit is exceeded. The Crab nebula was created by one of these events observed in 1054. For 15 points, name these explosions that occur at the end of some stars' life cycles.

ANSWER: **supernova** [accept more specific answers like **type Ia supernova**; accept **supernova remnants**]

048-12-85-13113

BONUS: This is a 30-second calculation question. What is the positive slope of a line that makes an angle of 60 degrees with the x-axis?

ANSWER: **root 3** [or **radical 3**; prompt on **tan(60)**]

197-12-85-1310-1

14. This element causes vesicles to fuse with the presynaptic membrane at the axon terminal when voltage-gated channels for its cation open. Troponin is activated by this element, which is released from the sarcoplasmic reticulum in its 2+ charged ionic form to induce muscle contraction. Vitamin D regulates blood levels of this metal, a key component of enamel whose deficiency is one cause of osteoporosis. For 15 points, name this alkaline earth metal present in bones.

ANSWER: **calcium** ion [or **Ca²⁺**]

104-12-85-13114

BONUS: Immanuel Kant's *Critique of Judgment* is considered a foundational text in what subfield of philosophy, which analyzes questions such as the definition of art and whether there is an objective standard of beauty?

ANSWER: **aesthetics** [or **aesthetic** philosophy; prompt on **philosophy of art**]

019-12-85-1310-1

15. This poet concluded, "Our tree yet crowns the hill, our Scholar travels yet the loved hill-side" in a pastoral elegy written for his friend Arthur Hugh Clough. This poet of "Thyrsis" also wrote of an "eternal note of sadness" heard long ago by Sophocles (SAHF-uh-klees) in a poem in which the speaker exclaims, "Ah, love, let us be true to one another!" For 15 points, name this Victorian poet who described a "darkling plain...where ignorant armies clash by night" in his poem "Dover Beach."

ANSWER: Matthew **Arnold**

014-12-85-13115

BONUS: This layer marks the transition from the mixed surface water layer to the deep water layer. In what layer of water does water temperature decrease rapidly with depth?

ANSWER: **thermocline**

066-12-85-1310-1

16. Minor characters in this film include Fred Richmond and Milton Arbogast. One character in this film states, "I think we're all in our private traps, clamped in them. In this film, a scene taken from seventy-seven different angles utilized chocolate syrup for blood. This 1960 film centers on Marion Crane and the unstable Norman Bates, who manages a motel and allegedly lives with his vitriolic mother. For 15 points, identify this Alfred Hitchcock film featuring an iconic murder scene in a shower.

ANSWER: **Psycho**

189-12-85-13116

BONUS: Which Beatle recorded "Imagine" as a solo artist and also recorded albums with his wife, Yoko Ono?

ANSWER: John Winston Ono **Lennon**

088-12-85-1310-1

17. Morley's theorem states that this figure can be constructed from another polygon's angle trisectors. A fractal named for Sierpinski (SEAR-pin-skee) consists of these polygons placed inside one another. The area of this shape can be found using the formula s^2 times the square root of three divided by four. All medians are congruent in this figure, as are all altitudes. For 15 points, name this kind of triangle that has three sixty degree interior angles and three congruent sides.

ANSWER: **equilateral triangles** [or **equilateral** triangles after "this kind of triangle" is read; prompt on **triangles**]

131-12-85-13117

BONUS: In what Vermeer portrait does the subject look towards the viewer while wearing a blue and yellow head scarf and the title jewelry?

ANSWER: *The* **Girl with the Pearl Earring**

015-12-85-1310-1

18. This author wrote about title characters who are seduced by Darryl Van Horne in *The Witches of Eastwick*. He wrote about Sammy quitting his job in a vain effort to defend the honor of three attractive girls in swimsuits in his story "A&P." This author also created the former basketball star Harry Angstrom, who is "at rest," "is rich," and "runs" in a series of novels. For 15 points, name this American novelist of the Rabbit novels.

ANSWER: John **Updike** [or John Hoyer **Updike**]

015-12-85-13118

BONUS: What English Baroque composer wrote the semi-opera *The Fairy-Queen* and the opera *Dido and Aeneas*?

ANSWER: Henry **Purcell**

014-12-85-1310-1

19. Like glucagon, this hormone's binding to a GPCR results in the creation of cAMP as a "second messenger," stimulating breakdown of glycogen and releasing glucose into the bloodstream. Injected into patients to treat anaphylactic shock, this hormone binds to beta-1 receptors to increase heart rate and works with a neurotransmitter whose name is this hormone's prefixed with "nor." For 15 points, name this hormone that contributes to the fight-or-flight response and is sometimes called adrenaline.

ANSWER: **epinephrine** [or **adrenaline** before it is read]

080-12-85-13119

BONUS: Name the month of the Islamic calendar in which Muslims must fast from dawn to dusk.

ANSWER: **Ramadan**

080-12-85-1310-1

20. Thomas Walker forged one path through this mountain range. The Transylvania Company later hired Daniel Boone to explore and expand the path into the Wilderness Road, which goes through the Cumberland Gap in this range. The Proclamation of 1763 prevented settlement beyond it, angering colonists in Virginia and Pennsylvania. For 15 points, name this mountain range in the eastern United States that includes the Smokies and the Blue Ridge.

ANSWER: **Appalachian** Mountains

121-12-85-13120

BONUS: This is a 30-second calculation question. If there are 8 people in a room and each person shakes the hand of every other person exactly once, what is the total number of handshakes?

ANSWER: **28**

197-12-85-1310-1

21. One type of these particles is the namesake of a type of tagging used in analysis of collider events. A bound state of two of these particles was discovered by Ting and Richter and was called J-psi. These particles cannot be isolated as singlets due to the property of confinement, and they also carry color charge. Within a hadron, they are held together by gluons, and their flavors include charm, strange, top, and bottom. For 15 points, name this fundamental particle posited by Gell-Mann, three of which make up protons and neutrons.

ANSWER: **quark** [accept more specific answers like **strange quark**]

048-12-85-13121

BONUS: What novelist wrote *Ethan Frome* and described the marriage of Newland Archer and May Welland in *The Age of Innocence*?

ANSWER: Edith **Wharton** [or Edith Newbold **Jones**]

079-12-85-1310-1

22. Of its country's 47 prefectures, it is the largest and the only one designated as a "circuit" type. This region's city of Hakodate is one terminus of the long Seikan Tunnel under the Tsugaru Strait. The La Perouse Strait separates Sakhalin Island from this region that is the primary home of the Ainu people. This island has held annual snow festivals and the 1972 Olympic Games in its capital city of Sapporo. For 15 points, name this second largest and most northerly of the main islands of Japan.

ANSWER: **Hokkaido** Prefecture [or **Hokkaido** Island; or **Northern Sea Circuit**]

153-12-85-13122

BONUS: What predecessor to Mario Monti said he would run again for the Italian premiership with the People of Freedom party?

ANSWER: Silvio **Berlusconi**

121-12-85-1310-1

23. One poem about this conflict depicts a conversation between two dead participants and is titled "Strange Meeting." Robert Graves described this conflict in *Good-Bye to All That*. One poem about this conflict asks, "What passing bells for these who die as cattle?" Another poem about this conflict condemns "the old lie" told to its participants and describes the "ecstasy of fumbling" during a gas attack. For 15 points, name this conflict depicted by War Poets such as Siegfried Sassoon and Wilfred Owen.

ANSWER: **World War I** [or the **First World War**]

191-12-85-13123

BONUS: What Indian prime minister was assassinated by her bodyguards after ordering Operation Blue Star on the Golden Temple at Amritsar?

ANSWER: **Indira Priyadarshini Gandhi** [prompt on **Gandhi**]

153-12-85-1310-1

24. At this battle, Daniel Sickles lost his leg while his army was massacred at the Peach Orchard. Devil's Den and Culp's Hill were sites at this battle, in which James Longstreet attacked Little Round Top. One assault at this battle went up the middle of Cemetery Ridge. George Meade's army fended off the doomed Pickett's charge at this three-day Union victory. For 15 points, name this July 1863 battle in Pennsylvania that was followed by a short Abraham Lincoln address.

ANSWER: Battle of **Gettysburg**

104-12-85-13124

BONUS: In a 1961 speech, FCC chairman Newton Minnow referred to what medium as "a vast wasteland"?

ANSWER: **television**

030-12-85-1310-1

25. One of this composer's symphonies has an extra movement marked "Feierlich" and quotes the main theme of Brahms's third symphony in its opening *Lebhaft* movement. He never completed his "Zwickau" Symphony, but included "The Poet Speaks" and "Traumerai" among his *Scenes from Childhood*. The poems of Adolph Boettger inspired his first symphony, nicknamed the "Spring." Name this German composer married to Clara Wieck, who composed the "Rhenish" Symphony.

ANSWER: Robert **Schumann**

192-12-85-13125

BONUS: This is a 20-second calculation question. What is the volume of a cube with surface area 24 square centimeters?

ANSWER: **8** cubic centimeters

003-12-85-1310-1



26. In one work, this man created Clive Durham and Alec Scudder, who are both lovers of the title character, *Maurice*. In another work by this author, Helen tries to help Leonard Bast with advice from Mr. Wilcox, costing him his job. That work ends with the union of the Wilcox and Schlegel families at the title estate. Another novel by this author of *Howards End* sees Dr. Aziz accused of sexually assaulting Adela Quested in the Marabar Caves. For 15 points, name this British author of *A Passage to India*.

ANSWER: E. M. **Forster** [or Edward Morgan **Forster**]

191-12-85-13126

BONUS: Name the scientist who oversaw the “gold foil experiment,” demonstrating the existence of the atomic nucleus.

ANSWER: Ernest **Rutherford**

019-12-85-1310-1

27. One approximation related to these objects states that the index of refraction minus one times the difference between the reciprocal of the radii of curvature equals the inverse of a certain quantity. That approximation is the thin "this device" approximation. When an object is placed off their primary axis they create comas. Their focal length over their focal length minus their distance from an object is equal to their magnifying power. For 15 points, name these optical devices that refract light and come in concave and convex forms.

ANSWER: **lens**

149-12-85-13127