1. If one knows this value for a principal axis, one can use Steiner's theorem to calculate it for a parallel axis. The discrete form of this quantity is the sum of the product of mass with distance from the principal axis squared. Commonly derived values for this quantity include two-fifths m r-squared for spheres and one-half m r-squared for disks and cylinders. For 15 points, name this rotational analogue of mass.
ANSWER: **moment of inertia**

147-12-85-01101

BONUS: What period of Japanese history following the Tokugawa Shogunate saw the namesake emperor come to power and bring in Western influence?
ANSWER: **Meiji Restoration** [or **Meiji Ishin**]

014-12-85-0110-1

2. In 2005, this region experienced a magnitude 7.6 earthquake that killed 80,000 people and destroyed the town of Balakot. A state within this region has both summer and winter capitals, Jammu and Srinagar. This region is divided by both the "line of control" and the "line of actual control," which sets off its Aksai Chin region. This region contains part of the Karakorum range, including K2. For 15 points, name this region of the Indian subcontinent, which is disputed by India and Pakistan and which exports a characteristic type of wool.
ANSWER: **Kashmir** [or Jammu and **Kashmir**; or Azad **Kashmir**; prompt on **India**; prompt on **Pakistan**]

080-12-85-01102

BONUS: The TATA box is commonly the site of what process in which mRNA in synthesized from DNA?
ANSWER: **transcription**

079-12-85-0110-1

3. Stromatolites were formed in this substance. Hypoxic or anoxic areas in this substance are known as dead zones. The temperature at which this substance is densest is lowered below four degrees celsius when its salinity is not zero. Its solid form is less dense than its liquid form. This substance participates in a namesake cycle that, in part, involves evaporation and precipitation. For 15 points, identify this substance found in the oceans, which has formula H_2O.
ANSWER: **water** [or ocean **water**; or sea **water**]

066-12-85-01103

BONUS: Name the French philosopher and mathematician who wrote *Meditations on First Philosophy* and famously declared, "I think, therefore I am."
ANSWER: Rene **Descartes**

014-12-85-0110-1

4. This president's policies were supported by newsman Walter Winchell and Supreme Court justices Cardozo, Brandeis, and Stone. His Secretary of Labor was Frances Perkins. He attended the Casablanca Conference as a member of the Big Three. This deliverer of the Fireside Chats helped create the Civilian Conservation Corps and the National Recovery Administration as part of his New Deal. For 15 points, name this four-term president who led the US through the Depression and World War II.
ANSWER: Franklin Delano **Roosevelt** [or **FDR**]

015-12-85-01104

BONUS: What river that rises in the Black Forest is the second-longest in Europe and flows through Vienna, Belgrade, and Budapest?
ANSWER: **Danube** River

5. This character has a friend who "wanders and watches, with eager ears" until he hears the "measured tread of the grenadiers." This character gives "a cry of defiance, and not of fear, a voice in the darkness, a knock at the door." His actions occur on the "eighteenth of April, in Seventy-five," and are cued by "a lantern aloft in the belfry arch of the North Church tower as a signal light." For 15 points, name this character whose midnight ride to warn of impending redcoats was described by Henry Wadsworth Longfellow.
ANSWER: Paul **Revere** [or **Paul** Revere]

BONUS: What recently deceased comedian played a sheriff in the small town of Mayberry in a 1960's sitcom?
ANSWER: Andy **Griffith**

6. One novel by this author includes a monologue concluding with the words, "yes I said yes I will yes." Another novel by this author opens with the beginning of a story about "a moocow coming down along the road." The protagonist of that novel becomes sick after being pushed into a cesspool by his schoolmates at Clongowes Wood College. This novelist created Stephen Dedalus and Leopold Bloom, both of whom appear in his massive 1922 modernist novel. For 15 points, name this Irish novelist of *A Portrait of the Artist as a Young Man* and *Ulysses.*
ANSWER: James **Joyce** [or James Augustine Aloysius **Joyce**]

BONUS: What Danish author wrote such fairy tales as "The Little Mermaid" and "The Ugly Duckling"?
ANSWER: Hans Christian **Andersen**

7. Independently from Joseph Le Bel, he explained optical activity by proposing that certain molecules are shaped like tetrahedrons. His namesake equation uses the enthalpy [EN-thul-pee] change to relate temperature change to the change in the equilibrium constant. The effect of a particular solute species on colligative properties is measured by his namesake "factor." For 15 points, name this Dutch chemist who won the first Nobel Prize in Chemistry.
ANSWER: Jacobus Henricus **van 't Hoff**

BONUS: Name the 20th-century Russian composer of a first symphony in D major, commonly nicknamed "Classical," as well as *Peter and the Wolf.*
ANSWER: Sergei **Prokofiev**

8. The protagonist of this novel breaks the necks of a group of dying pheasants shot by hunters. The protagonist's husband leaves her to establish a farm in Brazil after she confesses an ambiguous sexual involvement with a man she later stabs before being arrested at Stonehenge. After her family is evicted, the protagonist reluctantly returns to the villainous Alec, and she is forgiven too late by Angel Clare. For 15 points, name this novel about a "pure woman faithfully presented" by Thomas Hardy.
ANSWER: *Tess of the d'Urbervilles*

BONUS: Britain's Queen Elizabeth II celebrated the 60th anniversary of her accession in 2012, an event known by what more elaborate term?
ANSWER: **Diamond Jubilee**

9. This emperor's tax hikes caused the Gallic revolt of Vindex. This ruler's death ended the Julio-Claudian dynasty and began a period of unrest known as the Year of the Four Emperors. This successor to Claudius probably poisoned his step-brother Britannicus. Some sources relate that this man's desire to build a new palace complex prompted him to start the Great Fire of Rome in 64 CE. For 15 points, name this Roman emperor famed for persecuting Christians and fiddling.
ANSWER: **Nero** Claudius Caesar Augustus Germanicus [or **Nero** Claudius Drusus Germanicus; or **Lucius Domitius Ahenobarbus**]

BONUS: This is a calculation question. Find the positive solution to the equation $x^2 - 4x - 21 = 0$ (x squared minus four x minus twenty-one equals zero).
ANSWER: **7**

10. This thinker explained how interest rates are determined using his concept of liquidity preference. This thinker criticized the massive reparations exacted from Germany in the Treaty of Versailles in his *The Economic Consequences of the Peace.* He argued for the necessity of increasing aggregate demand in a book which influenced American policies adopted during the Great Depression. For 15 points, name this British economist who advocated deficit spending in *The General Theory of Employment, Interest, and Money.*
ANSWER: John Maynard **Keynes**

BONUS: What children's character recorded a viral parody of "Call Me Maybe" entitled "Share it Maybe"?
ANSWER: **Cookie Monster** [or **Alistair Cookie**]

11. One of this architect's projects was overseen by his apprentice Bob Mosher, and he designed many buildings in his self-described "Usonian" style. He incorporated locally obtained desert rocks into the walls of his winter home in Scottsdale, Arizona called Taliesin West (TAH-lee-AY-zin). His most famous building, a Pennsylvania home for Edgar Kaufmann, was built over a running stream. For 15 points, name this Prairie School architect of Fallingwater.
ANSWER: Frank Lloyd **Wright**

BONUS: What Indian religion was led by ten gurus and has its adherents follow the "five K's"?
ANSWER: **Sikh**ism

12. In one story by this author, the overweight college student Mary Grace throws a book at the judgmental Ruby Turpin in the waiting room of a doctor's office. She wrote a novel in which Hazel Motes returns from World War II to his family home in Tennessee. In one story by this exemplar of the "Southern Gothic" style, a the grandmother's family is killed by an escaped convict named "The Misfit." For 15 points, name this author of the novel *Wise Blood* and the story "A Good Man Is Hard to Find."
ANSWER: Flannery **O'Connor** [or Mary Flannery **O'Connor**]

BONUS: This is a 20-second calculation question. Find the area, in square inches, of a trapezoid with base lengths 6 inches and 10 inches, and a height of 4 inches.
ANSWER: **32** square inches

13. Daniel Jones created the first system for classifying these entities. Jones' cardinal diagram for these can be used to illustrate chain shifts of them, examples of which include the Northern Cities and "Great" shift that occurred in the fourteenth century. A diphthong is two of these entities in the same syllable. For 15 points, name these sounds produced with an open vocal tract, which in English are usually represented by letters such as "A" and "E."
ANSWER: **vowel**s

BONUS: This is a 20-second calculation question. If the sine of an angle is 3/8 (three over eight) and its tangent is 3/2 (three over two), what is the cosine of the angle, in simplest terms?
ANSWER: **1 over 4** [or **1/4**]

14. This mathematician devised a topologically invariant measure that is two for all convex polyhedra. This man laid the foundation of graph theory in solving a problem that asked if it was possible to walk through a certain town while only crossing over every bridge in it once, the seven bridges of Konigsberg problem. His identity equates cosine of x plus i times sine of x to his namesake constant raised to the i x power. For 15 points, identify this Swiss mathematician who is the namesake of the constant e, equal to about 2.718.
ANSWER: Leonard **Euler** (OIL-er)

BONUS: What Spartan brother of Agamemnon is married to Helen before the Trojan War?
ANSWER: **Menelaus**

15. When this behavior occurs in fungi and plants, the result is known as a mycorrhiza. Lynn Margulis proposed that the "endo" form of this behavior explains the origin of some organelles. Varieties of this behavior include commensalism and parasitism. The clownfish and the sea anemone exhibit the mutualistic form of this behavior. For 15 points, name this behavior in which two different species live together, often both benefiting from the relationship.
ANSWER: **symbiosis**

BONUS: What Polish astronomer proposed a heliocentric theory in his *On the Revolutions of the Celestial Spheres?*
ANSWER: Nicolaus **Copernicus**

16. The addressee of this poem has become a "townsman of a stiller town," having slipped away "from fields where glory does not stay." This poem notes that "early though the laurel grows, it withers quicker than the rose." This poem concludes by describing how "the strengthless dead" will gather round the addressee, who was once chaired through the marketplace. For 15 points, name this A. E. Housman poem recalling "the time you won your town the race" to the title figure.
ANSWER: "**To an Athlete Dying Young**"

BONUS: What Italian artist painted *Primavera* and *The Birth of Venus*?
ANSWER: Sandro **Botticelli**

17. One poem in this collection ends by comparing mortal eyes to glazed mirrors reflecting the rays of light from a sacred source. Another poem in this collection addresses a woman who entered the speaker's heart like a dagger thrust and compares her to the title monster. The poem "The Denial of Saint Peter" opens this collection's section "Revolt," and the aforementioned "Benediction" opens its first section, "Spleen and Ideal." For 15 points, name this seminal poetry collection by Charles Baudelaire (BOH-duh-lair).
ANSWER: Les ***Fleurs du Mal*** [or The ***Flowers of Evil***]

BONUS: Name the sometime-exorcist who has pushed for educational reforms as Governor of Louisiana.
ANSWER: Bobby **Jindal**

18. This organelle's membrane contains a triose phosphate/phosphate antiporter. Proteins are shuffled within it via the twin-arginine translocator system. Proton pumping within this organelle creates one compartment with pH 8 and another with pH 4. Lamellae connect grana within this organelle. P700 and P680 reaction centers are found within the membranes of small sacs within this organelle known as thylakoids. For 15 points, name this photosynthetic organelle.
ANSWER: **Chloroplast**

BONUS: What equation has a pre-exponential factor and relates the rate constant of a reaction to its temperature and activation energy?
ANSWER: **Arrhenius** Equation

19. This man came to power by winning a power struggle over Sidney Rigdon and James Strang. He stepped down as governor after members of the Baker-Fancher party were killed in the Mountain Meadows Massacre. This man proposed the State of Deseret and was pardoned by James Buchanan after waging the Utah War. This successor to Joseph Smith started a settlement at Salt Lake City. For 15 points, name this early leader of the Mormon Church.
ANSWER: Brigham **Young**

BONUS: What Baylor quarterback was drafted by the Washington Redskins with the second overall pick of the 2012 NFL draft?
ANSWER: Robert Lee **Griffin** III [or **RGIII**]

20. This goddess brought a statue of Galatea to life for the sculptor Pygmalion. She fought with Persephone over the beautiful Adonis. She became the mother of Aeneas after falling in love with Anchises. She won a golden apple after bribing Paris by offering him the most beautiful woman in the world, sparking the Trojan War. This wife of Hephaestus was born from the sea foam caused by the castration of Uranus. For 15 points, name this Greek goddess of love.
ANSWER: **Aphrodite** [or **Venus**]

BONUS: This is a 20-second calculation question. What is the median of the set of numbers 4, 6, 3, 7, 2, 11?
ANSWER: **5**

21. The protagonist of this novel decides to get drinks with the Columbia student Carl Luce. One of its characters is given a "Little Shirley Beans" record and rides a carousel in the rain. Its protagonist loses some fencing equipment on the subway before encountering the prostitute Sunny. The central family in this novel includes the Hollywood writer D.B., the leukemia victim Allie, and the ten-year-old Phoebe. For 15 points, Holden Caulfield is the protagonist of what novel by J. D. Salinger?
ANSWER: *The **Catcher in the Rye***

BONUS: What Shakespearean character exclaims, "Lord, what fools these mortals be!" to Oberon in *A Midsummer Night's Dream*?
ANSWER: **Puck** [or **Robin** Goodfellow; or Robin **Goodfellow**]

22. One disease affecting this organ is its namesake "pinprick condition." Angiotensin-converting enzyme is primarily found in this organ. This organ's capacity can be measured using tidal volume, and its function can be measured using spirometry. Diseases affecting it include cystic fibrosis and emphysema. This organ is covered by a membrane called the pleura, and gas exchange in this organ takes place in the alveoli. For 15 points, name these organs of respiration.
ANSWER: **lung**s

BONUS: What nineteenth-century advocate of Irish Home Rule had a scandalous affair with Kitty O'Shea?
ANSWER: Charles Stewart **Parnell**

23. The fifth of these vessels successfully carried Belka and Strelka out and back. The second of these vessels was created with a small cabin that eventually overheated, causing the death of its occupant of four days named Laika. The first of these crafts stayed in orbit for a total of three months. For 15 points, name this Soviet program of satellites that first launched on October 4, 1957, and which started both the Space Age and the Space Race.
ANSWER: **Sputnik** 5 [or **Sputnik** 2; or **Sputnik** 1]

BONUS: This is a 20-second calculation question. An external angle of a regular polygon measures 12 degrees. How many sides does the polygon have?
ANSWER: **15**

24. The libretto for this opera was written by Emanuel Schikaneder, who was in the same Masonic lodge as its composer. The antagonist of this opera must sing 30 high C's and 4 F's above high C in the aria "Der Holle Rache." In this opera, Sarastro overcomes the Queen of the Night and arranges tests for the bird catcher Papageno and the protagonist, Tamino. For 15 points, name this Wolfgang Amadeus Mozart opera about an enchanted musical instrument.
ANSWER: *The **Magic Flute*** [or *Die **Zauberflöte***]

BONUS: Simone de Beauvoir's *The Mandarins* and Jack Kerouac's *On the Road* are examples of what kind of "novel with a key," in which real people and events are slightly fictionalized using new names?
ANSWER: *roman à clef*

25. The bell of the *U.S.S. Endicott* is now found at a church within this complex, the Evergreen Chapel. This complex is the home of the Aspen Lodge, and is found within Catoctin Mountain Park near Thurmont. Originally known as Shangri-La, this location was renamed in 1953 after Dwight Eisenhower's grandson. For 15 points, name this designated rural retreat of U.S. Presidents, the site of several diplomatic summits including landmark 1978 "accords" between Egypt and Israel.
ANSWER: **Camp David**

BONUS: What Kansas governor carried only Vermont and Maine in the 1936 election against Franklin Roosevelt?
ANSWER: Alfred Mossman **Landon**

26. Some authorities assert that this object symbolizes the four exiles in Babylon, Persia, Greece, and Rome. It displays an acronym for the phrase "nes gadol hayah sham" (NESS gah-DOLE hi-AH SHAHM), meaning "a great miracle happened there." Depending on which letter is facing up, players of this object may contribute, do nothing, or take half or all of the pot. For 15 points, identify this top-like device which is used to play a traditional game on Hannukah.
ANSWER: a **dreidel**

019-12-85-01126

BONUS: What document stipulated that no freeman would be tried outside the law of the land and was signed in 1215 at Runnymede by King John?
ANSWER: **Magna Carta**

153-12-85-0110-1

27. During this dynasty, the military was divided into the Eight Banners. This dynasty included the longest-reigning Chinese emperor, whose grandson was in power at the time of the White Lotus Rebellion. Including the Kangxi (KONG-shee) and Qianlong (CHYAN-lawng) emperors, this dynasty also defeated the forces of Hong Xiuquan (SHEE-oo-CHEW-on) in the Taiping Rebellion. This dynasty was established by the Manchus after the fall of the Ming Dynasty. For 15 points, name this final Chinese dynasty.
ANSWER: **Qing** Dynasty [accept **Manchu** Dynasty before read]

014-12-85-01127