1. This quantity can be expressed as the derivative of Helmholtz free energy with respect to temperature, and can also be expressed as Boltzmann's constant times the natural log of the microstates. This quantity can be described as a system's tendency towards positions with higher probabilities, and the second law of thermodynamics indicates that it is always increasing. For 10 points, identify this property which is sometimes described as the disorder of a system, symbolized S.
ANSWER: **entropy**

189-12-71-04101

2. One section of this novel is written as a hallucinatory play in which Edward VII appears while a protagonist fights with Private Carr. This novel opens as "stately, plump Buck Mulligan" performs a mass with shaving tools, and it concludes with a stream-of-consciousness monologue by the protagonist's wife, Molly. This novel follows the half-Jewish Leopold Bloom and the writer Stephen Dedalus through episodes like "Circe," "Telemachus," and "Eumaeus." For 10 points, name this modernist novel inspired by the *Odyssey* and written by James Joyce.
ANSWER: *Ulysses*

080-12-71-04102

3. This organ contains specialized macrophages known as Kupffer cells, and it is the site of albumin production. This organ is responsible for converting ammonia into urea, and it is the site of gluconeogenesis. This organ is also the site of lipid and cholesterol synthesis, and this organ also produces bile. For 10 points, identify this organ which can be afflicted by hepatitis, and which can be afflicted by cirrhosis in cases of alcoholism.
ANSWER: **liver**

189-12-71-04103

4. This author wrote about a Women's Tribunal that tries a magical fish for fostering male chauvinism in *The Flounder.* In another of his books, the protagonist is imprisoned in a mental asylum for the murder of Sister Dorothea. This author included *Cat and Mouse* and *Dog Years* in a set of three novels beginning with one in which Oskar Matzerath stops his own growth at age three. For 10 points, name this postwar German author of *The Tin Drum.*
ANSWER: Günter **Grass** [Günter Wilhelm **Grass**]

080-12-71-04104

5. In finance, a quantity denoted beta measures this value for an asset. Attempts by companies to set prices based on an average value for this quantity lead to a market failure called adverse selection. Daniel Kahneman and Amos Tversky examined its effect on decision-making in creating prospect theory. Diversification can reduce this quantity, as occurs in hedge funds; when it is non-diversifiable, it can be "spread" through insurance. For 10 points, name this measure of volatility that, when high, can correlate with high returns.
ANSWER: **risk** [or **volatility** before it is read]

080-12-71-04105

6. James Clerk Maxwell modified Ampere's law by adding a term for the "displacement" type of this quantity. This quantity can be written as the dot product of its namesake density, symbolized J, and cross-sectional area. This quantity can be measured using a galvanometer, and according to Ohm's law, this quantity is equal to voltage divided by resistance. For 10 points, name this quantity measured in amperes that describes the rate of flow of electric charge.
ANSWER: electric **current**

7. Maxwell Taylor headed a "study group" that reported on lessons that were learned from this event. One component of this event was a "deception flight" flown by a B-26 numbered 933. Officially known as Operation Pluto and Operation Zapata, this event included a planned landing at the foothills of the Escambray Mountains. The participants in this event were exiles from the Batista regime and were trained in several South Florida facilities by the CIA. For 10 points, name this botched 1961 attempt to overthrow Castro.
ANSWER: **Bay of Pigs** Invasion [or **Operation Trinidad**; or **Operation Pluto** before read; or **Operation Zapata** before read]

8. This character was raised by his Aunt Clara and hallucinates her scolding him at the end of the novel he appears in. This man was chased out of Weed on accusations of rape and is given a puppy by the "jerkline skinner" Slim. This figure's fate is foreshadowed by the death of Candy's dog. Constantly dreaming of being able to take care of the rabbits, he loves to pet soft things and accidentally breaks the neck of Curley's wife. For 10 points, name this mentally disabled ranch hand who is shot by his friend George at the conclusion of *Of Mice and Men.*
ANSWER: **Lennie** Small [or Lennie **Small**]

9. Properties of this substance can be measured with a CTD instrument. Samples of this substance can be obtained with a Niskin bottle. A secchi disk is used to measure the transparency of this substance. The presence and size of objects in this substance can be detected using SONAR. For 10 points, identify this substance that occupies most of the surface of the Earth and which typically has a salinity of about 35 parts per thousand.
ANSWER: ocean **water** [or sea **water**]

10. This leader dealt with American sailors being rowdy in Valparaiso in Chile after those sailors disembarked from the USS *Baltimore*. This running mate of Levi Morton dealt with the high-spending Billion Dollar Congress, signing the silver purchase and anti-trust acts of John Sherman and a tariff named for then-Senator William McKinley. For 10 points, name this Republican President who served between the two terms of Grover Cleveland, a grandson of the ninth president, William Henry.
ANSWER: **B**enjamin **Harrison** [prompt on **Harrison**]

11. This figure asks her friend "Jacque" if she might touch her breasts but is denied. This figure addresses most of her prose to someone named "Kitty," who is likely an imaginary friend. She receives her first kiss from Peter and writes that she still believes "people are really good at heart." Along with the Van Daans, Mr. Dussel, and her father, Otto, this figure spends her time in the upper room of her father's office building in Amsterdam. For 10 points, name this Jewish girl whose diary documents her family's attempt to hide during World War II.
ANSWER: **Anne** Frank [or Anne **Frank**; or **Annelies** Frank; or Annelies **Frank**]

052-12-71-04111

12. This state was served by Hiram Revels, the first black Congressman. James Chaney, Andrew Goodman, and Michael Schwermer were murdered in this state in 1964 while working on Freedom Summer, and James Meredith integrated its state university. This state at the southern end of the historical Natchez Trace trail is also where John Pemberton surrendered at Vicksburg. For 10 points, name this Southern state that once had as Senator the future Confederate president, Jefferson Davis.
ANSWER: **Mississippi**

104-12-71-04112

13. This player's 2008 dunk over Kevin Garnett prompted Kevin Harlan to exclaim that it was done "with no regard for human life." This player scored twenty-five consecutive points in a double-overtime victory over the Pistons in the 2007 Eastern Conference Finals. Dan Gilbert wrote a vitriolic letter attacking this player's decision to take his talents to South Beach in July of 2010. For 10 points, identify this NBA superstar who left the Cleveland Cavaliers to join Chris Bosh and Dwyane Wade on the Miami Heat.
ANSWER: LeBron **James** [prompt **LBJ**]

189-12-71-04113

14. The reciprocal of density is called the "specific" type of this quantity. Through is "b" constant, the van der Waals equation accounts for the fact that this quantity is nonzero for the particles being described. The product of this quantity and pressure appears in the ideal gas law, and this quantity is directly proportional to temperature in Charles's law. Density is calculated as mass divided by this quantity. For 10 points, name this quantity describing the amount of space taken up by an object.
ANSWER: **volume**

014-12-71-04114

15. In one novel set in this country, Maureen and Bamford Smales flee to a village with the title servant woman. In another work set in this country, the lawyer Mr. Carmichael defends the accused murderer of activist Arthur Jarvis. That novel set here ends with the execution of Absalom, the son of pastor Stephen Kumalo. This is the home country of the author of *July's People,* Nadine Gordimer, as well as Alan Paton. For 10 points, name this country, the setting of the novel *Cry, the Beloved Country* and other works criticizing apartheid policies.
ANSWER: Republic of **South Africa**

052-12-71-04115

1A. In 1965, Singapore was expelled from what neighboring country, which it was a part of for the previous two years?
ANSWER: **Malaysia**

1B. What outermost of the sun, easily visible during solar eclipses, is much hotter than its surface and emits namesake mass ejections?
ANSWER: **corona**

2A. Which tsar of Russia was assassinated by the People's Will and emancipated the serfs?
ANSWER: **Alexander II** of Russia [or **Aleksandr Nikolayevich**]

2B. Which type of algorithm in computer science, which uses a divide-and-conquer strategy in its binary variety, is used to locate a particular object?
ANSWER: **search**ing algorithm

3A. What country's troops led Operation Lightning Thunder in an attempt to fight the Lord's Resistance Army and capture Joseph Kony?
ANSWER: **Uganda**

3B. Percy Bysshe Shelley wrote what sonnet about a ruined statue of Ramses the Great?
ANSWER: "**Ozymandias**"

4A. This is a 20-second calculation question. Find the reference angle for the angle 1300 degrees.
ANSWER: **40** degrees [or **2pi/9 radians**; do not accept or prompt on "2pi/9"]

4B. This is a 30-second calculation question. What is the area of an isosceles triangle whose base is 6 units long and whose two legs are each 5 units long?
ANSWER: **6** square units

5A. What Norse deity wields the hammer Mjolnir ("me"-YOL-"near") and is the god of thunder?
ANSWER: **Thor**

5B. Which language, whose diacritical marks include *tashkeel*, is the basis for our numeral system, and is the official language of countries such as Oman and Kuwait?
ANSWER: **Arabic**

6A. Members of what profession in Britain brought down the Edward Heath government in a 1974 strike, but were thwarted in a 1985 action against Margaret Thatcher led by the NUM?
ANSWER: coal **miner**s

6B. Name this art movement whose glorification of technology and violence can be seen in works by Giacomo Balla and Umberto Boccioni.
ANSWER: Italian **Futurism** [or word forms]

7A. What man defeated Harold Godwinson at the Battle of Hastings and became the first Norman king of Britain?
ANSWER: **William the Conqueror** [or **William I** of England; or **William the Bastard**; or **Guillaume le Conquerant**; or **Guillaume le Batard**; or **William II of Normandy**; prompt on **William**]

7B. This is a 30-second calculation question. Find all real solutions to the equation (x+3)(x-2) = 6 (READ "quantity x + 3, times quantity x - 2, equals 6").
ANSWER: **3** and **-4** [must have both, accept either order]

8A. This is a 30-second calculation question. What is the probability of selecting a red sock, then a blue sock from a drawer that contains, in total, 3 red socks, 2 blue socks, and 5 green socks?
ANSWER: **1/15** [or **.067**; or **6.7%**]

8B. Members of what religion practice the *i-tal* diet and ritually smoke cannabis?
ANSWER: **Rasta**farianism

9A. Euler's solution of the Seven Bridges of Konigsberg problem was an important milestone in the study of what mathematical objects made of vertices and edges?
ANSWER: **graph**s

9B. What state capital, which forms a metropolitan area with nearby Ewing, overlooks the Delaware River despite being in another state?
ANSWER: **Trenton**, New Jersey

10A. What Babylonian king promulgated his namesake law code, which often punished 'an eye for an eye?'
ANSWER: **Hammurabi** [or **Hammurapi**]

10B. Which actor won an Oscar for his role of Lester Burnham in *American Beauty* and also played Lex Luthor in *Superman Returns*?
ANSWER: Kevin **Spacey**

1. In linear regression, this letter squared shows how good a fit the regression equation is. Selection that favors maximizing the number of offspring without regards to population density is called this type of selection. Avogadro's number times Boltzmann's constant gives a constant represented by this letter, the ideal gas constant. It refers to a set of numbers that includes algebraic and transcendental numbers in addition to the rationals. For 10 points, name this letter that represents the real numbers.
ANSWER: **R**

121-12-71-04117

2. Arias in this opera include "O patria mia" and "Ritnorna vincitor." The first act of this opera includes a ceremony involving priestesses in the Temple of Vulcan, and one figure in this opera professes her love for another after she is tricked by Amneris. Other characters in this opera include a king named Amonasro and a priest named Ramfis, and the title figure in this opera dies with her lover, Radames. For 10 points, identify this Giuseppi Verdi opera about the title Ethiopian princess.
ANSWER: *__Aida__*

189-12-71-04118

3. In one chapter of this work, several characters soliloquize on the meaning of an Ecuadorean doubloon nailed to a post. One character is this work worships a small, black idol called Yojo. That man frightens the narrator when they share a bed together at the Spouter-Inn. Both characters are in the crew of first mate Starbuck, who worries about the obsession of the captain of the *Pequod.* For 10 points, name this novel by Herman Melville about Captain Ahab's quest for the title white whale.
ANSWER: *__Moby-Dick__*

121-12-71-04119

4. In this city, Sean Smith's body was recently recovered from a burning building containing former Navy SEALS Glen Doherty and Tyrone Woods. This was the founding site and first home of a National Transitional Council led by Mustafa Abdul Jalil. In September 2012, an attack in this city, once blamed on the YouTube video "Innocence of Muslims", killed ambassador J. Christopher Stevens and three others at a US consulate. For 10 points, name this non-capital city where the 2011 revolution started in northeast Libya.
ANSWER: **Benghazi**, Libya

104-12-71-04120

5. This thinker asks how his reader would react to the news that one must live the same life over and over, forever, in a work which also describes a madman wandering with a lantern. He argued in *On the Genealogy of Morals* that Christianity brought about a "slave morality" that doesn't respect the will to power, and hailed the coming of an *ubermensch*. For 10 points, name this German philosopher who wrote *The Gay Science* and *Also Sprach Zarathustra*, who declared "God is dead" before going mad.
ANSWER: Friedrich Wilhelm **Nietzsche**

104-12-71-04121

6. This scientist's findings about atomic weights and molecular formulas were popularized by Stanislao Cannizzaro. This scientist's gas law states that, at a constant pressure and temperature, the volume of a gas is directly proportional to the amount of gas present. This man's number gives the amount of molecules in a mole of a given substance. For 10 points, identify this scientist who names the number 6.022 times 10 to the 23rd power.
ANSWER: Lorenzo Romano Amedeo Carlo **Avogadro**

7. The title character of this work angrily tells another, "You can't eat the orange and throw the peel away!" One character in this work is upset when another woman is in possession of his mother's stockings and later burns a pair of sneakers. Howard Wagner fires this work's protagonist, whose older brother, Ben, made a fortune in the diamond mines of Africa. Other characters in this work include Linda, Happy, and Biff. For 10 points, identify this Arthur Miller play about the last days of Willy Loman.
ANSWER: ***Death of a Salesman***

8. This region is legendarily home to a bird with metallic wings who brings luck to any miner who can follow it without being caught. This region was once home to the world's largest natural supply of sodium nitrate, but is now riddled with over a hundred abandoned mining towns. The weather in this area can possibly be blamed on the Humboldt current and the South Pacific High creating an inversion layer which results in the high level of aridity. For 10 points, name this South American region west of the Andes which is considered the driest desert in the world.
ANSWER: **Atacama** Desert

9. While the invention of this game is officially credited to Charles Darrow, it was effectively designed by Lizzie Magie as a way to demonstrate the philosophy of Henry George. A children's version of this game has the player running a water slide and a roller coaster. The original locations in this game were named after real places in Atlantic City, New Jersey. Tokens in this game include a thimble and a battleship. For 10 points, name this board game in which the player tries to avoid going to jail while buying properties like Boardwalk and Park Place.
ANSWER: ***Monopoly*** [or ***Monopoly Junior***; or The ***Landlord's Game***]

10. This poet concluded "And yet, God has not said a word!" in a poem whose speaker uses "one long yellow string" of his love's hair to strangle her. This author of "Porphyria's Lover" wrote a poem whose speaker points to a bronze statue of Neptune cast by Claus of Innsbruck after moving on from a painting by Fra Pandolf of the title character. In that dramatic monologue, this poet wrote of a nobleman who complains his ex-wife's heart was "too soon made glad" and implies that he had her killed. For 10 points, name this Victorian poet of "My Last Duchess."
ANSWER: Robert **Browning**

11. One condition resulting from defects in this organ is Meckel's diverticulitis. This organ features the Crypts of Lieberkuhn and Brunner's glands, and contains lymphoid tissue known as Peyer's Patches. It begins at the Sphincter of Oddi and is made up of the duodenum, jejunum, and ileum. This organ's microvilli help it absorb nutrients from the food that passes through it. For 10 points, name this organ that receives food from the stomach, which has a "large" counterpart.
ANSWER: **small intestine**

12. This composer was inspired by a storm in Majorca to repeat the note A-flat in imitation of the title phenomenon in his *Raindrop Prelude*, which is similar to the third of his four ballades. Famous pieces by this composer include a work inspired by the November Uprising in his home country, the funeral march from his second piano sonata, and a piece depicting a small dog chasing its tail, whose title does not reflect its duration. For 10 points, the *Revolutionary Etude* and *Minute Waltz* were composed by what Pole?
ANSWER: Frédéric François **Chopin**

13. These particles undergo a decrease in energy in the Raman effect and the Compton effect, in contrast to the elastic interaction they undergo in Rayleigh scattering. The energy of one of these particles is given by the product of Planck's constant and its frequency, and Thomas Young fired these particles at a double slit in an experiment demonstrating their wave nature. For 10 points, name these particles that comprise electromagnetic radiation such as visible light.
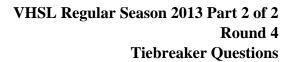ANSWER: **photon**s

14. One of this artist's works depicts himself in his studio painting a wreathed model carrying a book and trumpet as Clio. This artist of *The Allegory of Painting* painted a woman in yellow and blue standing in front of a table full of broken bread and pouring the title liquid of another work. In another work by this artist of *The Milkmaid*, a turbaned woman wears the title piece of jewelry. For 10 points, name this Dutch artist from Delft who painted *Girl with a Pearl Earring*.
ANSWER: Jan **Vermeer** [or Johannes **Vermeer**]

15. One component of this project was produced by *Rolling Stone* editor Timothy Ferris. It resulted in the 1990 image known as the "Family Portrait," a mosaic of 60 individual frames. This project also produced the photograph "Pale Blue Dot," which inspired a book by Carl Sagan. This project is best known for having its spacecraft contain phonograph records containing sounds and images for viewing by extraterrestrials. For 10 points, name this NASA program which launched two unmanned probes in 1977 to explore the outer solar system.
ANSWER: **Voyager** [or *Voyager 1*; or *Voyager 2*]

1. This poet stated that "Eden sank to grief, so dawn goes down to day," in his "Nothing Gold Can Stay." He described a horse who "gives his harness bells a shake" in a poem that ends with the repetition of the line, "And miles to go before I sleep." Another of his poems states that the speaker "took the road less traveled by, and that has made all the difference." For 10 points, name this American poet of "Stopping by Woods on a Snowy Evening" and "The Road Not Taken."
ANSWER: Robert **Frost** [or Robert Lee **Frost**]

192-12-71-04132

2. This author created the distinction between "round" and "flat" characters in a series of lectures called *Aspects of the Novel*. Margaret Schlegel pleads, "Only connect!" in this author's socially-aware novel *Howard's End*. This author created Lucy Honeychurch, who falls in love with George Emerson in Florence. In another of his novels, Adela Quested accuses Dr. Aziz of assaulting her in the Marabar Caves. For 10 points, name this English author of *A Room with a View* and *A Passage to India*.
ANSWER: Edward Morgan **Forster**

080-12-71-04133

3. Upton Sinclair ran as the Democratic candidate for governor in this state's 1934 election. Another person who lost a gubernatorial election in this state after serving as its Senator told reporters they wouldn't have him "to kick around anymore" in 1962. That man, Richard Nixon, failed to do what another man, nicknamed "the Gipper," did in defeating Pat Brown to become governor of this state. For 10 points, Ronald Reagan was governor of what state, currently home to Jerry Brown and Nancy Pelosi?
ANSWER: **California**

121-12-71-04134

4. This pathway contains the enzyme sedheptulose biphosphate, and results in the formation of G3P. This process includes reduction and regeneration phases, and NADPH acts as a reducing agent during this process. This process, which is partially named for Andrew Benson, uses the most abundant protein on earth as an enzyme; that enzyme is RuBisCO. Taking place in the stroma of the chloroplasts, for 10 points, identify this "dark reaction" which is paired with the light reactions of photosynthesis.
ANSWER: **Calvin**-Benson Cycle [prompt on **C3**, **C4**, **CAM**, or **carbon fixation**]

189-12-71-04135

5. By evaluating one over n prime times the integral from a to x of quantity x minus t to the n plus f n plus one of t dt, this amount can be found for the Taylor series. Performing the modulo operation yields this value. A story about a woman who loses a basket of eggs is often used to introduce a method to work backwards given several of these values; that is the "Chinese" theorem about them. This number is obtained alongside a quotient. For 10 points, name this amount left over during a division.
ANSWER: **remainder** [or **residual**]

020-12-71-04136

This is a 20-second calculation question. Find the sine of 870 degrees.
ANSWER: **1/2**

What author wrote about Ellen Olenska's affair with May Welland's husband, Newland Archer, in *The Age of Innocence*?
ANSWER: Edith **Wharton** [or Edith Newbold **Jones**]