1. Marian McPartland played this instrument on a radio show named for it until 2011. A performer of this instrument composed the soundtrack to the movie *Anatomy of a Murder,* and worked with the same composer who wrote his band's theme song, "Take the A Train." Bill Evans played this instrument for the Miles Davis sextet. "Straight, No Chaser" is a song for this instrument written by Thelonious Monk. For 10 points, name this percussion instrument played by Duke Ellington.
ANSWER: **piano**

121-13-95-08101

2. This actor played obnoxious jock Chris in the film *Whatever It Takes.* He originated the role of a psychotic performance artist in a series of *General Hospital* guest roles. In a 2013 film, he played a magician who idolizes Thomas Edison and becomes involved with the witches Theodora, Evanora, and Glinda upon arriving at the Emerald City. For 10 points, name this actor who played the lead roles in *Oz the Great and Powerful* and *Rise of the Planet of the Apes*.
ANSWER: James **Franco**

052-13-95-08102

3. Using this substance as a solvent for a solution of alkali metals results in the solvation of electrons. Quantum tunneling is used to explain the low barrier for the flip transition of this compound. One method of synthesizing this compound uses magnetite exposed to feedstock as a catalyst, and that process uses high pressure to create two atoms of it from N_2 and H_2. This compound is created in the Haber process. For 10 points, name this compound with formula NH_3.
ANSWER: **ammonia** [or **NH_3** until it is read; do not accept "ammonium"]

048-13-95-08103

4. In one of this author's novels, Ted Schacht and LaMont Chu are members of the Enfield Tennis Academy. This author's essays "Greatly Exaggerated" and "Derivative Sport in Tornado Alley" were collected in his *A Supposedly Fun Thing I'll Never Do Again.* This creator of the Incandenza family left his novel *The Pale King* unfinished when he committed suicide by hanging in 2008. For 10 points, name this American novelist of *Infinite Jest.*
ANSWER: David Foster **Wallace**

014-13-95-08104

5. Vitruvius's belief in this idea led him to suggest building libraries facing eastward. This idea was disproven for fungi by Pier Antonio Michelli. Aristotle propounded this idea using the idea of pneuma. It was partly disproven in an experiment involving placing meat in a jar by Francisco Redi, and finally disproven by boiling broth in a swan-necked flask. For 10 points, name this idea from biology disproven by Louis Pasteur, which believed that some forms of life could arise from dead matter.
ANSWER: **spontaneous generation**

048-13-95-08105

6. An author from this country wrote about Luis Molina, who discusses movies with Valentin Arregui (ah-rey-GWEE) in a prison cell. This country was home to the author of *Kiss of the Spider Woman* and a man who wrote about a series of hexagonal rooms with infinitely-many books in "The Library of Babel." That man from here also created the German spy Dr. Yu Tsun. For 10 points, name this country, home to Manuel Puig (PWEEG) and Jorge Luis Borges (HOR-hay loo-EES BOR-hays).
ANSWER: **Argentina**

7. This barbarian's destruction of the Burgundian city of Worms is recounted in an epic partly set at his court, the *Nibelungenlied* (NEE-bel-OON-gen-leed). This brother of Bleda was defeated when the Visigoth Theodoric I and the Roman general Flavius Aetius teamed up at the Battle of Chalons (shuh-LAHN). He was convinced to leave Italy after meeting Pope Leo I at Mantua, and was known as the "Scourge of God." For 10 points, name this great leader of the Huns.
ANSWER: **Attila** the Hun

8. This statement is used to describe the area of a state in phase space and the spreading of a wavepacket. This statement is illustrated via a thought experiment using its namesake's microscope. This statement is applied to operators whose commutator is nonzero. One side of this statement is a product of standard deviations and the other is h-bar over 2. For 10 points, name this principle which states that it is impossible to accurately measure a particle's position and momentum at the same time.
ANSWER: **Heisenberg** uncertainty principle [or **uncertainty** principle]

9. This composer may have coded the name of his fiancee, the Belgian soprano Desiree Artot, into one of his pieces. His program symphony based on Byron's poem "Manfred" is generally not included among his six numbered symphonies. The "Troparion of the Holy Cross" opens another of his compositions, in which the anthem "God Save the Tsar" prevails over "La Marseillaise" as sixteen cannon shots are fired. For 10 points, name this Russian composer who celebrated Napoleon's defeat in his *1812 Overture.*
ANSWER: Pyotr Ilyich **Tchaikovsky**

10. This writer aligned one of the title concepts with "the best which has been thought and said in the world" in his book *Culture and Anarchy.* In a poem, this writer described the "eternal note of sadness" heard long ago by Sophocles on the Aegean. That poem of his ends by depicting a "darkling plain swept with confused alarms" where "ignorant armies clash by night" and begins by describing a seascape. For 10 points, name this Victorian poet of "Dover Beach."
ANSWER: Matthew **Arnold**

11. Components of this quantity at a point are given by derivatives of the stream function. The curl of the vector field of this quantity is the vorticity. For a banked curve, the max value of this is equal to the square root of r times g times coefficient of static friction. The difference between the initial and final values of this quantity is equal to time times acceleration. For 10 points, name this quantity, which is given by the rate of change of displacement.
ANSWER: fluid **velocity**

12. In myth, this country faced invasions from the Milesians and Firbolg. A hero from this country's mythology won a series of duels to protect a stud bull from Queen Medb. Another hero from this country's myths habitually obtained wisdom by sucking the thumb he burned cooking the salmon of knowledge. This country's greatest heroes include Cuchullain (coo HOO lin) and Finn McCool. For 10 points, name this country whose mythological landscape is dotted with pots of gold guarded by leprechauns.
ANSWER: **Ireland** [or **Eire**]

13. A branch of mathematics that deals with these things was developed by Georg Cantor. The number of elements in one of these is its cardinality. One of them that contains all those that are not members of themselves leads to a contradiction in Russell's paradox. A backslash is used to represent the complement of two of these things while an "O" with a slash through it represents the empty one. For 10 points, name these mathematical collections that can be subject to union or intersection.
ANSWER: **set**s

14. The eastern part of a lake that lies in this country was the site of a battle lost by the Teutonic Knights when it was frozen; that lake is Peipus. The deepest freshwater lake in the world lies in this country. The mountain range that divides Europe and Asia, the Urals, lies mostly in this country. Its most important river is the Volga. For 10 points, name this country with capital at Moscow.
ANSWER: **Russia**

15. The gate symbolizing this operation appears like an English capital D, with a straight left side. If the first input to this operation is false, then the operator may short-circuit. A caret between two logical statements symbolizes this operation. It returns the minimum of two bits. Truth tables using this operation are false three-fourths of the time and only return true if both inputs are true. For 10 points, name this operation also known as logical conjunction, often symbolized with an ampersand.
ANSWER: **AND** [or logical **conjunction** until it is read]

1A. What beautiful youth spurned Echo and died after falling in love with his own reflection?
ANSWER: **Narcissus**

1B. What king of Sweden during the Thirty Years War was known as the Lion of the North?
ANSWER: **Gustavus Adolphus** [prompt on **Gustavus**]

2A. What man who worked with Gandhi became the first prime minister of India upon independence?
ANSWER: Jawaharlal **Nehru**

2B. In what Nathaniel Hawthorne short story does the title character see his wife Faith at a Witches' Sabbath?
ANSWER: "**Young Goodman Brown**"

3A. This is a 20-second calculation question. The ratio of men to women in a room is 3 to 2. If the men have average age 40, and the women average age 35, what is the average age of the whole room?
ANSWER: **38**

3B. This is a 20-second calculation question. What is the area of the square inscribed in a circle with circumference 20pi?
ANSWER: **200**

4A. What Cavalier poet wrote "To Lucasta, Going to the Wars" and "To Althea, from Prison"?
ANSWER: Richard **Lovelace**

4B. What second-most-populous city in Nevada is nicknamed "The Biggest Little City in the World?"
ANSWER: **Reno**

5A. What type of water flow is a major source of pollution and occurs when precipitation flows over the ground, rather than penetrating it?
ANSWER: surface water **run-off**

5B. In the epics of Homer, what goddess is given the epithets "Pallas" and "gray-eyed"?
ANSWER: **Athena**

6A. What British folk rock band included the songs "The Cave" and "Roll Away Your Stone" on their album *Sigh No More?*
ANSWER: **Mumford & Sons**

6B. J. Robert Oppenheimer was a part of what secret U.S. government project that developed the atomic bomb during World War II?
ANSWER: **Manhattan** Project

7A. What Scottish economist attacked mercantilism in *The Wealth of Nations*?
ANSWER: Adam **Smith**

7B. What principle states that electrons are added to lower energy levels before being added to higher ones?
ANSWER: **Aufbau** principle [or the **build**ing-**up** principle]

8A. What complex of protein and sugars makes up the bacterial cell wall and is taken up by the Gram stain?
ANSWER: **peptidoglycan** [or **murein**]

8B. What genetic disease is caused by a mutation in hexosaminidase A, resulting in a buildup of gangliosides in the brain?
ANSWER: **Tay-Sachs** disease

9A. What Canadian province borders North Dakota and Minnesota to the south and has its capital at Winnipeg?
ANSWER: **Manitoba**

9B. Parshva and Mahavira (mah-ha-VEE-ruh) were the last two of what heroes from Jainism who aid others in achieving enlightenment?
ANSWER: **Tirthankara**s

10A. This is a 30-second calculation question. If I flip two fair coins and roll a fair die, what is the probability the number of heads I flip equals the number on the die?
ANSWER: **1/8**

10B. This is a 30-second calculation question. A basketball team scored 57 points, shooting entirely two and three-point shots. If they made 22 shots total, how many points did they score off three-pointers?
ANSWER: **39**

1. In the 1940s, this company was dominated by "personnel chief" Harry Bennett prior to the hiring of Air Force veterans such as Robert McNamara and the other "Whiz Kids." This company achieved initial success offering a product that came in "any color the customer wants, as long as it's black" before stumbling with the Edsel and recovering by introducing the Thunderbird. For 10 points, name this company that built the Model T on pioneering assembly lines.
ANSWER: **Ford** Motor Company

019-13-95-08117

2. According to the Curse of 1940, this object was desecrated by having the mortgage of Madison Square Garden burned in it. In July 2013, Justin Bieber stood on a team's logo while taking a picture of this object. A tradition for this trophy is that the members of the winning team drink champagne out of its bowl. It is named for the Governor-General of Canada who donated it in 1892. For 10 points, name this trophy awarded every year to the winner of the playoffs of the National Hockey League.
ANSWER: **Stanley Cup**

023-13-95-08118

3. One description of this phenomenon uses Green's theorem to solve the wave equation at a point based on its solutions at all points on a surface around the point; that is Kirchoff's formulation. This phenomenon occurring at a knife edge is the subject of Huygens principle, which in another system creates the Airy disk. It can occur through gratings, single slits, or circular apertures. For 10 points, name this phenomenon in which light bends around an obstacle.
ANSWER: **diffraction**

048-13-95-08119

4. This poem draws on myths discussed in Jessie L. Weston's book *From Ritual to Romance.* This heavily-footnoted poem explicates the meaning of *datta* (DAH-tah), *dayadhvam* (DYE-ahd-vahm), and *damyata* (dahm-YAH-tuh) in its final section, "What the Thunder Said." This poem's first section, "The Burial of the Dead," begins with the line, "April is the cruelest month." For 10 points, name this modernist poem by T. S. Eliot.
ANSWER: *The **Waste Land***

014-13-95-08120

5. In proton NMR, this is the value of the chemical shift of tetramethylsilane (TET-ruh-METH-uhl-SILL-ane). This is the value of the angular momentum quantum number of an s orbital. A reaction with a rate law of this order has a rate completely independent of reactant concentration, and compounds form a perfect crystal at this temperature on the Kelvin scale. For 10 points, give this number, which also denotes a law of thermodynamics relating two systems in equilibrium with a third system.
ANSWER: **zero**

048-13-95-08121

6. Near the end of this poem, the author imagines a "hoary-headed swain" recalling how his death caused him to be missed one morning "on the customed hill." This poem describes how "the ploughman homeward plods his weary way" and imagines rustics whose "sober wishes never learned to stray" as they remained "far from the madding crowd's ignoble strife." This poem begins, "The curfew tolls the knell of parting day." For 10 points, name this elegy by Thomas Gray.
ANSWER: "**Elegy Written in a Country Churchyard**"

014-13-95-08122

7. In October 2013, this country announced the creation of the "Ministry of Supreme Social Happiness," which then declared that Christmas would begin on November 5 and encouraged citizens to loot electronics stores. In December, the ruling PSUV split this country's local elections with opposition candidates endorsed by Henrique Capriles (en-REE-kay cah-PREE-lace), who lost to Nicholas Maduro in April 2013. For 10 points, name this country where Maduro succeeded Hugo Chavez.
ANSWER: Bolivarian Republic of **Venezuela** [or Republica Bolivariana de **Venezuela**]

019-13-95-08123

8. Taking this operation on lambda times the identity minus A yields the characteristic polynomial. The inverse of A is equal to one over this function of A times the classical adjoint, and this function is used to find whether a particular linear transformation is invertible. This alternating multi-linear operation is used to solve systems of linear equations via Cramer's rule. For 10 points, name this operation on a matrix denoted by vertical bars, which for a two-by-two matrix is equal to a d minus b c.
ANSWER: **det**erminant

048-13-95-08124

9. In a play by this author, a rich girl on a cruise ship named Mildred Douglas calls the protagonist a beast before he goes to the zoo to see the title animal. This creator of Yank in *The Hairy Ape* also wrote about the denizens of Harry Hope's saloon. The matriarch Mary is a morphine addict in his posthumously published play about the Tyrone family. For 10 points, name this American playwright of *The Iceman Cometh* and *Long Day's Journey into Night.*
ANSWER: Eugene **O'Neill**

014-13-95-08125

10. Many Indo-European languages use a plural form for this English word, which may indicate that proto-Indo-Europeans used a two-part version of this item. Romanians refer to it as an "usa," related to the Latin term "ostium." Another Latin term for this item is derived from the Greek and is the origin of contemporary Western Romance words for it, such as the French "porte" and Spanish "puerta." For 10 points, identify this object which enables you to enter a "casa."
ANSWER: a **door**

019-13-95-08126

11. This artist's *The Woman in the Green Dress* was one of many of his paintings to feature Camille Doncieux. This man spent his later life living in the town of Giverny. (JIV-er-nee) His painting of a boat in the harbor of Le Havre lent its name to the Impressionist movement. This artist also painted several series of works showing Rouen Cathedral and haystacks from different angles and in different lights. For 10 points, name this Impressionist known for his paintings of water lilies.
ANSWER: Claude **Monet**

015-13-95-08127

12. Andrew Kitzenberg posted videos and tweets documenting the aftermath of this event. This event was blamed on Sunil Tripathi after a faulty investigation by Reddit. Three days after this event, Sean Collier was killed on the MIT campus. *Rolling Stone* was criticized for putting a perpetrator of this event on its August 2013 cover. For 10 points, name this event carried out on April 15, 2013, by the Tsarnaev brothers, in which they set off two explosives near the finish line of a race.
ANSWER: **Boston Marathon bombing**s [or obvious equivalent phrasings]

13. The amendment barring this practice was introduced to Congress by Spessard Holland, formerly a committed segregationist. This practice was outlawed at the state level in the 1966 *Harper v. Virginia* case. For federal elections, this practice was outlawed by the Twenty-Fourth Amendment. It often exempted white voters via a "grandfather clause." For 10 points, name this type of disenfranchisement which required a fee to be paid prior to voting.
ANSWER: **poll tax**

14. This artist's *Separation of Light from Darkness* is surrounded by four ignudi. James Beck has criticized the 1980 to 1994 project to restore this man's paintings. This artist painted a critic with donkey ears and snake-covered genitalia in his largest painting, which includes a self-portrait as St. Bartholomew holding his flayed skin. He also created a painting in which the fingers of God and Adam nearly touch. For 10 points, name this Renaissance painter of the Sistine Chapel ceiling.
ANSWER: **Michelangelo** Buonarroti

15. It's not the pancreas or intestine, but CTLA-4 polymorphisms signal an autoimmune disease of this organ which is treated with PTU. The foramen cecum forms during the descent of this organ, which contains parafollicular and follicular cells. Another autoimmune disease of this organ causes exophthalmos (ehk-sof-THAL-muss), or eye-popping, and is Graves disease. Goiters occur in this gland when there isn't enough iodine to make its namesake hormone. For 10 points, name this gland in the neck.
ANSWER: **thyroid** gland

1. At the start of this war, Joseph de Jumonville was killed in an incident which the two sides labeled either "spying" or the assassination of a diplomat. Jumonville's brother, Louis Coulon de Villiers (VEEL-yay), won a battle in this war that destroyed Fort Necessity. This war resulted in the transfer of eastern Canada to Britain after James Wolfe's victory at the Plains of Abraham. For 10 points, name this North American phase of the larger Seven Years' War, which ended in 1763.
ANSWER: **French and Indian** War [prompt on **Seven Years'** War until it is read]

019-13-95-08132

2. One author from this country wrote the play *Accidental Death of an Anarchist.* Another author from this country wrote a novel in which "you, the reader" are the protagonist that meets Ludmilla at a bookstore. A playwright from this country wrote a play in which the Son shoots himself with a revolver and the Child drowns in a fountain entitled *Six Characters in Search of an Author.* For 10 points, name this country, the home of Italo Calvino and Luigi Pirandello.
ANSWER: **Italy**

227-13-95-08133

3. Boules of this element are cut into wafers to form the most common semiconductor substrate. Biogenous sources of this element include the frustules of diatoms. A framework of this element's dioxide, as well as aluminum and potassium, sodium, or calcium, characterizes feldspars. Soda-lime glass majorly consists of this element's dioxide. Minerals composed of this element and oxygen make up the vast majority of the Earth's crust and include quartz. For 10 points, identify this element with chemical symbol Si.
ANSWER: **silicon** [or **Si** until it is read]

066-13-95-08134

4. This author created the fussy gentleman Morose, who marries the title "silent woman" in his play *Epicoene* (EP-ih-seen). In another of his plays, the plague forces Lovewit to leave his house in the hands of his servant Face, who teams up with the prostitute Dol Common and the con artist Subtle to defraud customers with the promise of the philosopher's stone. For 10 points, name this contemporary of Shakespeare who wrote the comedies *Volpone* and *The Alchemist.*
ANSWER: Ben **Jonson**

014-13-95-08135

5. The gix-L and gix-R sites are found in one of these things called mu. The cos (CAHS) sequence from one of these things is used to create cosmids. The DNA ligase from the T4 variety of these things is commonly used in cloning. The DNA or protein from one of them was radioactively labelled in the Hershey-Chase experiment, which showed that they inject DNA into their hosts. For 10 points, name these viruses that infect bacteria.
ANSWER: bacterio**phage**s [prompt on **virus**]

048-13-95-08136

What country's King Zog fled to the U.S. after his overthrow by Italy in 1939?
ANSWER: Republic of **Albania** [or Republika e **Shqiperise**]

This is a calculation question. Consider the equation "y equals tan open parentheses quantity x minus quantity pi over 4 close parentheses." At what angle between 0 and pi radians would the graph of this equation have a vertical asymptote?
ANSWER: **3 pi over 4** radians [or **3/4 pi** radians; or **0.75 pi radians**; or **135 degrees**]