1. These regions are the bounding areas of horsts and grabens. These regions can create a namesake type of breccia. A theory about these regions states that they can suddenly elastically rebound. The thrust type of these regions can create mountains. These regions are split into a hanging wall and a foot wall, and can be classified as normal and strike-slip. These discontinuities in the crust release energy during earthquakes. For 10 points, identify these regions which include the San Andreas one.
ANSWER: **fault**s [or **fault** zones; or **fault** lines; prompt on convergent plate **boundary**]

066-13-90-06101

2. These compounds bind to the acceptor stem. In living things, these compounds are nearly always found in their L-stereoisomers. Hydrogen bonds form between every four of these compounds in an alpha helix. They commonly exist as zwitterions at neutral pHs, made up of a carboxylate, an ammonium, a hydrogen atom, and a side chain. The degeneracy of the genetic code explains why there aren't 64 of these coded for by mRNAs, only 20. For 10 points, name these building blocks of proteins.
ANSWER: **amino acid**s

190-13-90-06102

3. One of this author's novels opens with Pete helping his friend in a fight, though his seduction of Jimmie's sister, the title character, leads to her prostitution and death. One of this author's protagonists takes up the flag during a seemingly suicidal charge of the 304th Regiment. This author of *Maggie, A Girl of the Streets* is best known for a novel about the initially-cowardly Civil War soldier Henry Fleming. For 10 points, identify this American author of *The Red Badge of Courage.*
ANSWER: Stephen **Crane**

233-13-90-06103

4. This sculptor depicted the assassination of an Assyrian general by a widow in his *Judith and Holofernes.* This man sculpted *St. Mark* and *St. George* for the Orsanmichele. He created an equestrian statue of Erasmo of Nami known as *Gattamelata,* and he also sculptured a boy with his foot on the head of the slain Goliath. For 10 points, name this Renaissance artist famous for his bronze, nude *David.*
ANSWER: **Donatello** [or Donato di Niccolo di Betto **Bardi**]

227-13-90-06104

5. Anarchist Alexander Berkman attempted to murder the chairman of a company that produced this good when workers with this product launched the Homestead Strike. The best-known magnate in the production of this good wrote "The Gospel of Wealth" to advocate philanthropy on the part of the upper classes, having himself built a fortune despite being an immigrant from Scotland. For 10 points, name this product of the Bessemer Process off of which Andrew Carnegie made his fortune.
ANSWER: **steel** [prompt on **iron**]

080-13-90-06105

6. This group originally featured Ron McGovney as bassist. McGovney's replacement died in a bus crash in Sweden in 1986. A song by this band says, "Blood will follow blood, dying time is here." That song is "Damage Inc." The cover art of this band's fourth album shows the statue of Lady Justice cracked, bound by ropes, and her scales being tipped by money. For 10 points, name this American metal band with songs such as "Seek and Destroy", "One", and "Enter Sandman"
ANSWER: **Metallica**

225-13-90-06106

7. Optical power resulting from this phenomenon is maximized in an echelette grating. Von Laue pioneered the use of X-rays undergoing this phenomenon to study crystal structures. This phenomenon led to interference when electrons were fired at a nickel target in the Davisson-Germer experiment. It also created dark and light spots from interfering light waves in the double slit experiment. For 10 points, name this phenomenon in which light bends around obstacles.
ANSWER: **diffraction** [or **interference** before mention]

8. At the end of this play, two characters attempt to hang themselves by taking off one of their belts, only for its owner's pants to fall off. It ends with the stage direction "They do not move," which follows the line "Yes, let's go." In this play, Pozzo appears twice carrying Lucky around on a rope. It mostly consists of the discourse between two tramps who call each other Didi and Gogo, Vladimir and Estragon. For 10 points, name this absurdist play by Samuel Beckett in which the title character fails to make an appearance.
ANSWER: *Waiting for Godot* [or *En Attendant Godot*]

9. Critical damping occurs when a value named for this letter is equal to ½. Glutamine is symbolized by this letter. The set of rational numbers is labeled with this letter. RT divided by NF is multiplied by the log of a quantity symbolized by this letter in the Nernst equation; at equilibrium, that number is equal to the equilibrium constant. For 10 points, name this letter which designates heat, electric charge, and the reaction quotient.
ANSWER: **Q**

10. The chelating agent EDTA can be used in the complexometric type of this technique. A curve named after this technique includes the equivalence point. The endpoint of this technique can be denoted by an indicator such as phenolphthalein. This technique, which has an acid-base type, uses a buret. For 10 points, name this chemical technique used to determine the concentration of a solution.
ANSWER: **titration** [accept word forms]

11. In one of this author's books, he writes that he feels like a chess piece that has been told it cannot move by an opponent. This author contrasted the happy "knight of faith" with the "knight of infinite resignation." In one of his books, he explored the anxiety Abraham felt when being told to sacrifice Isaac. This man used such aliases as "Johannes de Silentio" and "Hilarius Bookbinder." For 10 points, name this Danish philosopher who wrote *Fear and Trembling* and *Either/Or.*
ANSWER: Søren Aabye **Kierkegaard** [or Johannes de **Silentio** until it is read; or Victor **Eremita**; or William **Afham**; or Frater **Taciturnus**; or Constantin **Constantius**; or Vigilius **Haufniensis**; or Nicolaus **Notabene**; or A.B.C.D E.F. **Godthaab**; or A.B.C.D.E.F. **Rosenblad**; or **Inter et Inter**; or **Procul**; or Captain **Scipio**; or **Judge William**; or **A.F.**; or Hilarius **Bookbinder** until it is read; or Johannes **Climacus**; or **H.H.**; or **Anti-Climacus**; prompt on **A**; prompt on **B**]

12. An important source for this colony's history is the journal of its thirty-time governor, William Bradford. This colony established a crucial alliance with the Wampanoag chief Massassoit. This colony's first European inhabitants left the Netherlands on the *Speedwell.* This colony's inhabitants learned to grow maize with the help of the Patuxet Indian Squanto. For 10 points, name this colony in modern-day Massachusetts founded after the *Mayflower* reached a namesake "rock."
ANSWER: **Plymouth** Colony [prompt on **Massachusetts**; do not accept or prompt on "Massachusetts Bay Colony"]

13. Sir Philip Sidney's *Defence of Poesy* describes the common medieval practice of predicting the future by selecting a line at random from this text. One character in this text falls behind in a footrace by slipping in some blood from an animal sacrifice, but trips another competitor to allow his friend to win. Earlier in this text, Aeolus summons a storm at the behest of Juno, who hates the main character as he is a survivor from Troy. The main character wars against Turnus after fleeing Carthage following the suicide of Dido. For 10 points, name this Latin epic poem written by Virgil.
ANSWER: *Aeneid*

14. At this battle, one side's Breton force was repelled and made to believe that their leader had died. A landing at Pevensey preceded this engagement, which came after a victory at Stamford Bridge. This battle, which is depicted on the Bayeux Tapestry, ended with the death of Harold Godwinson. For 10 points, name this 1066 battle won by William the Conqueror to begin the Norman conquest of England.
ANSWER: Battle of **Hastings**

15. Charlie Citrine writes plays about Von Trenck in one of this author's novels. Another of his characters travels with Romilayu, and becomes revered after moving a wooden statue. A character created by this author marries Madeleine and writes numerous unsent letters. This author of *Henderson the Rain King* wrote about a character who travels to Mexico after growing up in Chicago. For 10 points, name this author of *Herzog* and *The Adventures of Augie March*.
ANSWER: Saul **Bellow**

1A. What archipelago is separated by the Strait of Magellan from mainland Chile and Argentina?
ANSWER: **Tierra del Fuego** [or the **Land of Fire**]

1B. The rules governing the use of what number first appeared in a text by Brahmagupta?
ANSWER: **zero**

2A. What author of *Capitalism and Freedom* was the leader of the Chicago School of economics and promoted monetarism?
ANSWER: Milton **Friedman**

2B. What painting by Jean-Honore Fragonard depicts a hidden man peeking at a pink-dressed woman riding the title object?
ANSWER: *The **Swing*** [or *L'**Escarpolette***]

3A. This is a 20-second calculation question. How many real numbers satisfy the equation "4 x squared minus 17 x plus 20 equals 3"?
ANSWER: **2**

3B. This is a 20-second calculation question. In a game of Monopoly, if you roll doubles on three straight rolls of two dice, you go directly to jail. If you play with two fair dice, what is the probability of this happening?
ANSWER: **1/216** [or **1 out of every 216** turns]

4A. What Norse god of winter was killed by Vali after accidentally slaying his brother Baldr?
ANSWER: **Hod**ur

4B. What pair of students kidnapped and killed Bobby Franks and were defended at their trial by Clarence Darrow?
ANSWER: Nathan **Leopold** and Richard Albert **Loeb** [prompt if only one name is given]

5A. What tennis player founded the Women's Tennis Association and gives her name to a center that is the home of the US Open?
ANSWER: Billie Jean **King** [or Billie Jean **Moffitt**]

5B. The Nina and Pinta sailed alongside what flagship of Christopher Columbus' trans-Atlantic expedition?
ANSWER: **Santa Maria**

6A. Coleridge's "On a Volunteer Singer" is an example of what kind of brief, witty or memorable statement?
ANSWER: **epigram**

6B. What three-dimensional coordinate system specifies points in terms of their distance to the origin and angle to two axes?
ANSWER: **spherical** coordinates

7A. What Netflix original series is based on a book by Piper Kerman and stars Taylor Schilling as Piper Chapman, a woman imprisoned for transporting drug money?
ANSWER: *Orange is the New Black*

7B.  What conical flask found in laboratories is named for a German chemist?
ANSWER: **Erlenmeyer** flask

8A.  What prolific German author wrote of an artist's unrequited love for Lotte in *The Sorrows of Young Werther*?
ANSWER: Johan Wolfgang von **Goethe**

8B.  In which opera by Mozart does a statue at a dinner party drag the title character, a notorious seducer, into hell?
ANSWER: ***Don Giovanni*** [or *Il dissoluto punito, ossia il **Don Giovanni***]

9A.  This is a 30-second calculation question. A rectangular prism has a volume of 80 cubic centimeters and all three dimensions are integers. If the base is a square, what is the minimum height of the prism?
ANSWER: **5** centimeters

9B.  This is a 30-second calculation question. What is the cosine of the arcsin of negative 5/6? Express your answer in simplest radical form.
ANSWER: square **root** of **11, over 6** [or **radical 11, over 6**]

10A.  What literary character is shipwrecked at the mouth of the Orinoco River and frees a prisoner whom he names Friday?
ANSWER: Robinson **Crusoe** [or **Robinson** Crusoe]

10B.  What language uses scripts such as *romanji*, *kanji*, and *katakana*?
ANSWER: **Japanese**

1. Richard Lawrence tried to assassinate this president. This president won a battle two weeks after the Treaty of Ghent was signed. This "Hero of New Orleans" fought against an institution led by Nicholas Biddle and lost the 1824 election due to a compromise that was dubbed the "Corrupt Bargain." This signer of the Indian Removal Act also fought the Second Bank of the United States. For 10 points, name this seventh president, who was nicknamed "Old Hickory."
ANSWER: Andrew **Jackson**

186-13-90-06117

2. This composer's short piano piece *Albumblatt* was rediscovered and given its premiere in 2012. This man's fourth symphony includes variations of a theme from Bach's *Cantata No. 150*. His *Four Serious Songs* were written in memory of Clara Schumann, with whom this composer was in love. This composer included student drinking songs in his *Academic Festival Overture.* For 10 points, name this German composer who composed a famous lullaby.
ANSWER: Johannes **Brahms**

030-13-90-06118

3. This empire fought wars against the Tarascan Kingdom, which was located west of it. Formed out of an alliance among three city-states, this empire fought Flower Wars with neighboring cities and used prisoners from them in sacrificial rites. The downfall of this empire came after they mistook one enemy's arrival as that of the god Quetzalcoatl. For 10 points, name this Mesoamerican civilization, which was conquered by Hernan Cortes.
ANSWER: **Aztec** Empire [or the **Aztecs**]

140-13-90-06119

4. This novel's sequel features characters Lew Rabinowitz and Sammy Singer, and is titled *Closing Time*. A name mixup in this novel leads to the sending home of A. Fortiori, instead of the man Major Sanderson thought crazy, leading to the protagonist asking Dobbs if he will kill Colonel Cathcart. M&M Enterprises makes millions for this novel's character Milo Minderbinder. In this novel, Yossarian can't stop flying bombing missions unless he's insane, but his desire to stop bombing proves his sanity. For 10 points, identify this novel by Joseph Heller.
ANSWER: *Catch-22*

233-13-90-06120

5. In a book by this author, the protagonist's friend realizes he has left at home the sermons he was planning to publish while at Mr. Tow-house's inn. That work's protagonist meets his friend Abraham Adams while fleeing the unwanted advances of Lady Booby. In another of this man's novels, the protagonist learns he is not the illegitimate son of Jenny Jones but Squire Allworthy's sister. This man parodied Samuel Richardson's books in *Shamela* and a book about Pamela's brother, *Joseph Andrews.* For 10 points, name this author of *Tom Jones.*
ANSWER: Henry **Fielding**

121-13-90-06121

6. This principle is put into use for the Haber-Bosch process in determining the temperature and pressure to use. This principle does not apply to reactions that make use of a catalyst, or in reactions where pressure is changed but the same number of gas molecules are on both sides. For 10 points, identify this principle named for a French chemist that describes how changes to conditions such as temperature and pressure can cause a change in a reaction's equilibrium.
ANSWER: **Le Chatelier**'s principle

7. A mountain in this country has a glacier named for Walter Furtwangler. In this country, creatures named Fifi and David Greybeard demonstrated toolmaking skills by "fishing" for termites. It has a mountain whose highest peak is named "Uhuru." This country is home to the Gombe Stream National Park where Dr. Jane Goodall has studied chimpanzees. For 10 points, name this African country that is home to Mount Kilimanjaro.
ANSWER: United Republic of **Tanzania**

8. The adjacency variety of these constructs are used in solving graph theory problems and are often symmetric. These things are Hermitian if equal to their own conjugate transpose. When they are non-singular, they represent a linear transformation, and the sum of some of their elements is called their trace. One can use the expansion by minors technique to find the determinants of these things. For 10 points, name these rectangular arrays of numbers which have rows and columns.
ANSWER: **matrices** [or **matrix**, accept rectangular **array**s before mentioned]

9. This book's protagonist rejects Mistress Hibbins' offer to meet the "Black Man" in the forest while practicing witchcraft. The narrator claims to have found the title object while working in a Massachusetts customs house. When three characters learn their journey to Europe will include the protagonist's husband, Arthur Dimmesdale reveals in an Election Day speech the symbol seared into his chest. For 10 points, name this novel by Nathaniel Hawthorne where Hester Prynne wears the title badge of shame.
ANSWER: *The **Scarlet Letter***

10. The national park of Rock Creek is in the middle of this city. Diagonal streets intersect its street grid at traffic circles as part of the city plan of Charles L'Enfant. The Freer Gallery has a large collection of Asian art in this city and is part of a larger museum group that includes the Hirshorn Gallery and the Air and Space Museum. This home to the Smithsonian at one time contained land now part of Arlington County. For 10 points, name this capital of the United States.
ANSWER: **Washington**, D.C. [or Washington, **D.C.**]

11. This man once hung a bronze snake on a pole to heal those who had been bitten by snakes for complaining. His sister was struck with leprosy for speaking out against his marriage to an Ethiopian woman. This man could not enter Canaan after he struck a rock to bring forth water, and he first saw God on Mount Horeb in the form of a burning bush. His brother was Aaron, who created the Golden Calf when this man was on Mount Sinai. For 10 points, name this Jewish leader who led the Israelites out of Egypt.
ANSWER: **Moses**

12. In January 2011, a homeless man living in this state gained fame after a video showcased his "golden voice." Another resident of this state gave an interview in May 2013 in which he said a woman's action was a "dead giveaway." That interview in this state took place after the rescue of Gina DeJesus, Michelle Knight, and Amanda Berry. For 10 points, name this state in which Ariel Castro held women captive for more than ten years in his house in Cleveland.
ANSWER: **Ohio**

13. In plants, the reduction of P680+ is coupled with the production of NADPH and this molecule. The classic model of enzyme cooperativity is the binding of four molecules of this molecule to protein. This molecule is the final electron acceptor in the electron transport chain. In the absence of this molecule, muscle cells produce lactate. Aerobes require this compound to live. For 10 points, name this molecule which is exchanged with carbon dioxide by the lungs.
ANSWER: diatomic **oxygen** [or **O2**; or molecular **oxygen**]

14. This data type is most commonly represented using two's complement notation. In many languages, the keywords short and long are used to define a variable of this data type. Addition and subtraction on data of this type uses modulo arithmetic, and arrays are indexed by data of this type. float and this data type are the most common numerical data types. For 10 points, identify this data type that only stores whole numbers.
ANSWER: signed binary **int**egers [or **integral** data type; prompt on **binary** numbers]

15. In one of this author's novels, a longshoreman teams up with Martin Decoud to smuggle silver from Charles Gould's mines. The main character of another novel by this man is stranded in the Central Station waiting for his steamship to be repaired. The narrator of that novel by him comes across a pamphlet reading "Exterminate all the brutes" and lies to a widow about the words "The horror! The horror!" For 10 points, name this author of *Nostromo* and a book about Marlow's journey to Africa to find Kurtz, *Heart of Darkness.*
ANSWER: Joseph **Conrad** [or Jozef Teodor **Konrad** Korzeniowski]

1. This law can be stated that the product of conductivity and electric field equals the current density. The proportionality constant in this law equals resistivity times length over cross-sectional area. For 10 points, name this law which gives the change in electric potential through a resistor as voltage equals current times resistance, whose discoverer also names the SI unit of resistance.
ANSWER: **Ohm's** Law

190-13-90-06132

2. A politician during this war dismissed the Treaty of London as "a scrap of paper" when his country violated it. Sir Edward Grey allegedly said "The lamps are going out all over Europe" on the eve of this war. Propaganda posters referred to the "Rape of Belgium," which was part of the Schlieffen Plan. This war's nominal cause was the assassination of Archduke Ferdinand. For 10 points, name this war fought between Allied and Central powers from 1914 to 1918.
ANSWER: **World War I** [or **Great War**]

121-13-90-06133

3. While living at Salem House, the main character of this work fantasizes about being like the literary character Roderick Random and is punished by Mr. Creakle for wearing a sign that reads "Take care of him. He bites." One character in this work was a clerk in Mr. Wickfield's law office, steals Miss Trotwood's fortune, and is named Uriah Heep. The main character's first marriage is to Dora Spenlow, and he ultimately marries Agnes Wickfield. For 10 points, name this semi-autobiographical novel by Charles Dickens.
ANSWER: *__David Copperfield__*

030-13-90-06134

4. In a reversible compression, this quantity equals RT times the log of the ratio of volumes. This quantity equals the negative integral of pressure with respect to volume, and the First Law of Thermodynamics relates the change in internal energy to heat and this quantity. This quantity is equivalent to the change of kinetic energy in a system, and like energy, is measured in joules. For 10 points, name this quantity equal to the dot product of force and displacement.
ANSWER: **work**

190-13-90-06135

5. In 2013, this country's president engaged in several legal conflicts with Grupo Clarìn, which is targeted by a new law on media ownership. This country seized the assets of Spanish oil company Repsol in 2012, and was warned of an IMF "red card" in 2013 after producing false data on inflation and GDP. For 10 points, name this country which has been governed since 2003 by one family, since Nestor Kirchner was succeeded by his wife Cristina Fernández.
ANSWER: Republic of **Argentina**

019-13-90-06136

What nematode studied by Sydney Brenner is often used as a model organism?
ANSWER: *__C. elegans__* [or *__Caenorhabditis elegans__*]

This is a calculation question. What is the reference angle for an angle measuring 1,150 degrees?
ANSWER: **70** degrees