



Question #1: Math – Math Concepts

10 points

<p>The symmetry of this quadrilateral is dihedral [die-HEE-drul] group D4, and its rotational symmetry is order four. This shape is generated by the graph of the relation the absolute value of x plus the absolute value of y equals a constant. This quadrilateral has diagonals that are both congruent to each other and perpendicular bisectors. This regular quadrilateral is a rhombus with right angles. Each of the faces of a cube is one of these shapes. Name this shape that is a rectangle with congruent sides.</p>	<p><u>squares</u></p>
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Question #2: Social Studies – World History

10 points

<p>Allied forces in this country, as part of Operation Bertram, built dummy tanks and disguised the real ones. This country's site of Sidi Barrani [sih-dee bah-RAH-nee] was the launching point for an Italian invasion that failed. Following victory at Tobruk [TOE-bruk], Erwin Rommel led an invasion of this country, but was stopped at El Alamein [ah-lah-MAIN]. Forces from what is now this country fought the Hittites at the Battle of Kadesh [KAH-desh] under Ramesses [RAM-sees] the Second, one of its New Kingdom pharaohs. Name this North African country that is the home of the Suez Canal.</p>	<p>Arab Republic of <u>Egypt</u></p>
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Question #3: Science – Chemistry

10 points

This element is commonly used to isolate silicon from silica. This element also makes up lampblack, which is used in tires and dry cell batteries. An acid named for this element is blamed for ocean acidification. This element is added to iron to make pig iron, and some remains when the pig iron is purified into steel. Because one allotrope of this element is shaped like a geodesic dome, it is called buckminsterfullerene. This is also the primary element in coal. Name this element found in graphite, diamonds, and organic compounds.

carbon [prompt on C]

Question #4: Fine Arts – Classical/Opera

10 points

This composer's *Ave* [AH-vay] *Verum Corpus* was his final completed piece of liturgical music. His symphonies include ones named for Prague and the Haffner family. His 41st symphony in C major ends with a 5-part double fugue, and as a child his father Leopold forced him to tour Europe with his sister Nannerl. Name this child prodigy who composed the “Jupiter” Symphony and *Eine Kleine Nachtmusik* [EYE-nuh KLIE-nuh NAKT-myoo-sik].

Wolfgang Amadeus Mozart



Question #5: Literature – U.S. Literature

10 points

<p>The narrator of this poem compares himself to an apple orchard, and he compares another man to a pine. This work contains a complaint about hunters who please their yelping dogs; the narrator has to follow up after them to fix the title object. The spell “stay where you are until our backs are turned” is used on the boulders that made up the title structure. Name this Robert Frost poem in which the narrator says “good fences make good neighbors.”</p>	<p><u>“Mending Wall”</u></p>
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Question #6: Social Studies – Geography

10 points

<p>This state is home to the Misty Fjords National Monument, which is part of Tongass [TON-gus] National Forest. Some cities in this state, such as Wrangell [RAIN-gul] and Yakutat [YA-kuh-tat] are considered their own boroughs. This state’s Bush is home to such towns as Kotzebue [KOTZ-bway] and Barrow. This state contains Denali National Park and Preserve, the home of Mount McKinley, and this state also includes the Aleutian [ah-LOO-shun] Islands. Called “Seward’s Folly” upon Russia’s sale of it to the US, name this northernmost state.</p>	<p><u>Alaska</u></p>
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Question #7: Science – Biology

10 points per part

When two of these structures are next to each other, they are held together by a middle lamella [luh-MEH-luh].		
1	Name these rigid structures that surround cell membranes in plants, bacteria, and fungi.	cell <u>walls</u>
2	Cell walls contain this polysaccharide [po-lee-SAK-uh-ride] which is highly concentrated in cotton and used to make paper.	<u>cellulose</u>
3	The middle lamella is made of this substance used in jellies.	<u>pectin</u>

Question #8: Science – Biology

10 points per part

Humans have twelve pairs of these bones.		
1	Name these bones that surround several organs such as the heart and lungs.	<u>ribs</u>
2	Most of the ribs are connected to this bone known as the breastbone.	<u>sternum</u>
3	This is the cartilage that connects the ribs to the sternum.	<u>costal</u> cartilage [prompt on <u>hyaline</u> cartilage]



Question #9: Social Studies – Religion

10 points per part

In Hinduism, the embodied soul, or <i>atman</i> , is untouched by this process, which stops when one achieves <i>moksha</i> , or freedom from suffering.		
1	Name this concept of one’s soul surviving after death in the body of someone new.	reincarnation [accept word forms and rebirth]
2	During reincarnation cycles, one’s soul still is impacted by this concept, the collection of one’s actions, as well as the results of those actions. One could reincarnate into a higher class if this was good.	karma [do not accept “dharma”]
3	In the <i>Bhagavad-Gita</i> [BAH-gah-vahd GEE-tah], karma is presented as one of these “paths” to achieve ultimate enlightenment and union with <i>Brahman</i> .	yogas

Question #10: Social Studies – Religion

10 points per part

The founding of the church at Antioch is found within this New Testament book.		
1	Name this Biblical book which describes a mission from Antioch to Rome, as well as a split in the early church between Hellenists and Hebrews.	Acts of the Apostles [accept Actus Apostolorum]
2	Chapter 9 of Acts contains the story of the conversion of this apostle. By the end of the book, he is in jail and awaiting trial.	Paul the Apostle [accept Saul of Tarsus]
3	This founder of the Coptic Church accompanied Paul on the mission to Antioch, along with Barnabas.	John Mark [prompt on John]



Question #11: Math – Statistics

10 points per part

Though there is no standard definition of this term, it can be used to mean a percentage of scores lower than the score being measured.		
1	Name this measure often used with standardized tests.	<u>percentile</u>
2	If there are twenty students in a class, what percent of the students scored lower than the highest-scoring student?	<u>95</u> [percent or percentile]
3	Rounded to the nearest whole number, what percentile corresponds to one standard deviation above the mean in a normal distribution?	<u>84</u>

Question #12: Math – Statistics

10 points per part

Answer these questions about trying to fit a curve to data.		
1	This quantity equals the difference between the actual value of a function and the predicted theoretical value of the function. If there is a pattern to this quantity, then you should consider other curves for your fit.	<u>residuals</u>
2	If you fit a line to the two points (2,8) and (5,20), what should be the slope of the line?	<u>4</u>
3	On that line, what is the residual for the point (7,31)?	<u>3</u>



Question #13: Literature – U.S. Literature

10 points per part

This “memory play” is narrated by a poet that works in a shoe warehouse.		
1	Name this drama in which the narrator joins the merchant marine using funds meant to pay the electric bill. This leads to the lights going out during a dinner featuring the “gentleman caller” Jim O’Connor.	<i>The <u>Glass Menagerie</u></i>
2	This author of <i>The Glass Menagerie</i> wrote about Big Daddy, Brick, and Maggie in <i>Cat on a Hot Tin Roof</i> .	Tennessee <u>Williams</u>
3	Laura’s favorite piece in the menagerie is a figure of this mythical animal. After it is accidentally broken, Laura gives it to Jim as a souvenir.	<u>unicorn</u>

Question #14: Literature – U.S. Literature

10 points per part

This writer satirized Hollywood moguls through the characters of Bobby Gould and Charlie Fox in <i>Speed-the-Plow</i> .		
1	Name this dramatist who wrote about a junk shop owner’s plans to steal back a coin he sold in <i>American Buffalo</i> .	David <u>Mamet</u>
2	This other David Mamet [MA-met] play featuring a robbery concerns the theft of prime leads [leeds] by Shelly Levene and Dave Moss, two real estate salesmen.	<i><u>Glengarry Glen Ross</u></i>
3	Following <i>Speed-the-Plow</i> , Mamet wrote a one-act play about Bobby Gould in this location. Jean-Paul Sartre said this place is other people, and Don Juan is often portrayed going to this place full of demons.	<u>Hell</u> [accept equivalents]



Question #15: Miscellaneous – Consumer Education

10 points

The state of Washington used to have an example of this concept called an opportunity to dance. In Kentucky, this concept is applied to candy without flour but not candy with flour. The Whiskey Rebellion was sparked by an attempt to enforce one of these policies on producers. When applied at multiple levels, it is referred to as “value-added.” A number of states have passed “Amazon tax” laws to force many online businesses to collect and remit it. Name this tax that is most often paid by consumers when purchasing goods.

sales tax [accept excise tax until “value-added”, prompt on tax]

Question #16: Science – Earth Science

10 points

In these regions, **barite** [BEAR-ite] and **gypsum** [JIP-sum] can form what look like roses. In these regions, rocks can form patterns called regs or gibber, and one type of valley that forms is called a **wadi** [WAH-dee]. **Welwitschia** [wel-WIT-schee-uh] plants tend to grow in these regions, and plants in general in these regions tend to have small leaves or no leaves at all. There is some debate as to whether or not frigid regions should be included in this category, which includes regions with very little plant life. Name these areas that receive very little precipitation, such as the **Gobi** [GOE-bee] and the Sahara.

deserts



Question #17: Literature – British Literature

10 points

<p>The prelude to this work describes an orphan who destroyed his enemies and their drinking halls to become a king, Scyld Scefing [skild SKEH-feeng]. Battle-sweat as a description of blood was among the many kennings in this poem. Translated into English by Frances Grummere, one character has an arm ripped off during an attack on Heorot [HAY-oh-rote], a mead-hall. The title character of this work helps Hrothgar [HROTH-gahr], the king of the Danes. Name this Old English epic poem detailing the murder of Grendel by the title character.</p>	<p><u>Beowulf</u></p>
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Question #18: Social Studies – U.S. History

10 points

<p>This country hosted the ceremony for the resolution of the Chamizal [chah-MEE-zahl] dispute. Abraham Lincoln's Spot Resolutions concerned relations with this nation. The Punitive Expedition, led by John Pershing, ventured into this country to capture those responsible for the attack on the city of Columbus led by Pancho Villa. This country gave up a lot of territory in the Treaty of Guadalupe Hidalgo [gwah-dah-LOO-pay ee-DAHL-goe] after losing a war to the United States in 1848. Name this country found directly south of the Rio Grande.</p>	<p><u>Mexico</u> [or United <u>Mexican</u> States]</p>
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Question #19: Science – Biology

10 points

<p>A common blood coagulant [koe-A-gyoo-lunt] combines this acid with dextrose and sodium citrate [SIH-trate] in water. Its chemical formula is $C_6H_8O_7$ [see six aitch eight oe seven]. This acid is formed by the combination of oxaloacetate [oks-ah-loe-A-suh-tate] and acetyl-CoA [uh-SEE-tul koe-ae], and it changes into its conjugate when it takes in water and releases coenzyme [koe-en-zime] A. Those steps take place in the process that creates NADH and ATP. Name this acid sometimes used to name the Krebs cycle that is found in high concentrations in certain fruits such as lemons and oranges.</p>	<p><u>citric</u> acid [prompt on <u>citrus</u>]</p>
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Question #20: Literature – World Literature

10 points

<p>This title character is first encountered in the Scythian wild, and he claimed to take away the “expectancy of death” through the planting of “blind hope.” He refused to reveal to Hermes “by whom ‘tis fated that Zeus shall fall from power.” Kratos [KRAH-tose] calls this character “the lover of mankind” as he describes the punishment as ordered by Zeus. This Titan tricked Zeus into taking the inedible parts of cows. Name this title character of an Aeschylus [ES-kuh-lus] play, who is bound to a rock for giving mortals fire.</p>	<p><u>Prometheus</u></p>
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Question #21: Fine Arts – Art History

10 points per part

This man designed the Rock and Roll Hall of Fame and the City Hall of Dallas.		
1	Name this architect who designed the glass pyramid serving as the entrance to the Louvre.	I(eoh) M(ing) <u>Pei</u>
2	Pei’s firm designed this city’s tallest building, the John Hancock Tower. Another building in this city is Faneuil [FAN-ul] Hall.	<u>Boston</u> , Massachusetts
3	Pei designed this Illinois city’s University Apartments in its Hyde Park neighborhood, where Frank Lloyd Wright’s Robie House can also be found.	<u>Chicago</u> , Illinois

Question #22: Fine Arts – Art History

10 points per part

This painter often painted a single subject at different times of day, an example of which is his series of paintings of Rouen [roo-en] Cathedral.		
1	Name this impressionist painter of the <i>Haystacks</i> series.	Claude <u>Monet</u>
2	Monet painted these flowers growing on his estate’s pond in Giverny. Some of his paintings show the Japanese bridge over the pond, and his later paintings exhibit reddish hues believed to be caused by his cataracts.	<u>waterlilies</u> [or <u>waterlily</u> , prompt on <u>lily</u> or <u>lilies</u>]
3	Monet painted one of these events in Le Havre [HAH-vrah] in a painting entitled <i>Impression</i> , which gave its name to the impressionist movement.	<u>sunrise</u>



Question #23: Science – Chemistry

10 points per part

These depictions typically show pressure on the y-axis and temperature on the x-axis.		
1	Name these pictures that have solid, liquid, and gas sections that all meet at the triple point.	phase diagrams [prompt partial answer]
2	On a phase diagram, the border of the curve between the liquid and gas phases ends at this point.	critical point
3	This is the section of a phase diagram where the temperature and pressure are beyond the critical point.	supercritical fluid [prompt partial answer]

Question #24: Science – Chemistry

10 points per part

This term can refer to hydrocarbons that have no double bonds.		
1	Give this term that often refers to solutions that contain as much solute [SAHL-yoot] as they can.	saturated [accept word forms]
2	If a solute does not dissolve in a solution, this is the name for the solid that forms, typically at the bottom of the solution.	precipitate [or precipitation , do not accept “precipitant”]
3	Almost all salts with this cation [KAT-eye-on] are soluble even though this cation does not contain any alkali [AL-kuh-lie] metals other than possibly hydrogen. The chloride of this ion combines with silver cyanate [SIE-uh-nate] to make silver chloride and urea.	ammonium [or NH₄⁺]



Question #25: Social Studies – U.S. History

10 points per part

Its perpetrators were almost trapped on a practice football field before climbing Blanket Hill, which was followed by this controversial event.		
1	Name this conflict between student protestors and the state’s National Guard during which four students were killed. John Filo took an iconic photograph that featured the dead body of Jeffrey Miller.	<u>Kent</u> State shootings [accept <u>Kent</u> State Massacre or <u>May 4</u> Massacre]
2	The Kent State shootings took place in this state.	<u>Ohio</u>
3	The protesters who were fired upon were demonstrating against the United States’ protracted involvement in this conflict.	<u>Vietnam</u> War [accept answers focused on <u>Cambodia</u>]

Question #26: Social Studies – U.S. History

10 points per part

Following the act for which he would be executed, this man compared himself to the woman the act widowed in an attempt to raise funds for his trial.		
1	Name this lunatic [LOO-nah-tik] who firmly believed his actions swung the result of the 1880 Presidential election, and he thus deserved to be appointed consul to Austria, or later France.	Charles <u>Guiteau</u>
2	Despite his inflated ego, Guiteau [gee-toe] is best remembered for shooting this man, who had become president six months earlier.	James A. <u>Garfield</u>
3	After assassinating Garfield, Guiteau wrote to this Commanding General of the Army, asking him to take over the jail. During the Civil War, this general led the March to the Sea.	William Tecumseh <u>Sherman</u>



Question #27: Math – Geometry

10 points per part

Consider a diagram on which Point C is between Points A and F, and Point B is not on Line AF.		
1	What adjective describes Angle BCF with respect to Triangle ABC?	external angle
2	If Angle A measures fifty-five degrees and Angle B measures sixty-five degrees, what is the measure of Angle BCF in degrees?	120 degrees
3	What is the measure of Angle ACB?	60 degrees

Question #28: Math – Geometry

10 points per part

There are two triangles, ABC and DEF. Angle A is congruent to Angle D, Angle B is congruent to Angle E, and Angle C is congruent to Angle F.		
1	What is the relationship between the two triangles?	similar [accept word forms]
2	If Segment AB is length eight, Segment BC is length twelve, and Segment DE is length ten, find the length of Segment EF. Ignore units.	15 units
3	Assuming all the angle and side relationships described so far hold, if the area of Triangle ABC is sixteen, then what is the area of Triangle DEF? Ignore units.	25 square units



Question #29: Science – Physics

10 points

<p>The law adding the electric and magnetic values for this quantity is named for Lorentz. In a conservative field, this quantity is the opposite of the gradient of potential energy. This quantity divided by area gives pressure. The integral of this quantity with respect to time equals impulse. Non-inertial reference frames cause sensations known as the fictitious types of this quantity. This quantity equals the time derivative of momentum, which means that for constant mass this quantity equals mass times acceleration. Name this external influence, one example of which is gravity.</p>	<p>net <u>force</u></p>
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Question #30: Literature – U.S. Literature

10 points

<p>In this novel, a missionary undergoes facial scarring in solidarity with his native wife, who was subjected to female genital mutilation. In this novel, a sentence of twelve years' forced labor was handed down for insubordination; the defendant in that case, Sofia, had knocked down the mayor after being slapped. Much of the action in this novel is described in letters by the protagonist to God and her sister. Shug Avery helps the protagonist discover that letters from Nettie are not being delivered. Name this novel about Celie [SEE-lee] written by Alice Walker.</p>	<p><i>The <u>Color Purple</u></i></p>
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Question #31: Math – Math Concepts

10 points

This binary operation must be defined for two vectors in a vector space. A term in a Lucas sequence is found by performing this operation on the two previous terms. If two sets are disjoint, then applying this operation to their cardinalities gives the cardinality of their union. The principle of this operation determines how many ways there can be a single event. This operation is applied to vectors using the parallelogram law. The identity for this operation on numbers is zero. Name this operation equivalent to summation.

addition (accept word forms, accept plus and its word forms, accept sum and their word forms until the end)

Question #32: Social Studies – World History

10 points

Rebel leaders supporting the independence of this kingdom wrote the infamous Lubeck letter. Between the reigns of Donald II and Alexander III in 1249, this kingdom was referred to as Alba. Andrew Moray led its winning forces at the battle of Stirling Bridge. This kingdom was victorious at the Battle of Bannockburn under the leadership of Robert the Bruce. King Edward the First of England ordered the death of its hero William Wallace. One of its kings was Macbeth. Name this country that in 2014 voted to remain part of the United Kingdom.

Scotland



Extra Question #1: Fine Arts – Art History

10 points

This city's Basilica **Cistern [SIS-tern]** is a catacomb that has two columns built atop carved heads of Medusa. Mimar Sinan designed the largest religious building here, which is located on this city's Third Hill. This city is home to the Sultan Ahmed Mosque, which is colored blue, and **Anthemius of Tralles [an-THEM-ee-us of TRAHL-lus]** and Isidore of **Miletus [MY-leh-tus]** designed a church here that has mosaics depicting the Comnenus family. Name this city where the Suleyman Mosque and **Hagia [HAH-jee-uh]** Sophia are found.

Istanbul, Turkey

Extra Question #2: Social Studies – U.S. History

10 points

An uprising in this territory was the subject of the differing Morgan and Blount Reports. The Bayonet Constitution was signed in what would become this state, where Father Damien established a colony for lepers. Prior to annexation, it was ruled from the **Iolani [ee-oe-lah-nee]** Palace by Queen **Liliuokalani [lih-lee-yoe-kah-lah-nee]**. Name this state found in the middle of the Pacific Ocean.

Hawaii



Extra Question #3: Science – Astronomy

10 points

A 2014 study by NASA and ESA found that the nitrogen in Titan’s atmosphere matched the nitrogen in this location, supporting that this is where Titan was created. The inner part of this location is shaped like a disc and called Hills Cloud. This shell is located thousands of astronomical units from our Sun, beyond the scattered disc and the Kuiper belt. Name this source of long-period comets originally hypothesized by Ernst Opik and now named for a Dutch astronomer.

Opik-Oort Cloud

Extra Question #4: Literature – British Literature

10 points

While swimming, this character offended a mouse by asking “where is my cat” in French. After consuming a mushroom, she is mistaken for a snake by a pigeon seeking to protect her eggs. Transported by a gryphon to see the Mock Turtle, her size changes after consuming items labelled “DRINK ME” and “EAT ME.” Name this child who ventures into Wonderland in tales written by Lewis Carroll.

Alice [accept Alice’s Adventures in Wonderland]



Extra Question #5: Mathematics – Math Concepts

10 points

This value is the order of the Klein group, which is the smallest non-cyclic group. This is the least positive integer that is not a **Fibonacci [fih-boe-NAH-chee]** number. A simplex in this many dimensions has five vertices, and this value is also the number of dimensions of a tesseract. Numbers divisible by this value are called doubly even, and this is the middle number in the smallest Pythagorean Triple. This value is the least positive even perfect square. Identify this value equal to the number of faces of a tetrahedron and that is also the number of sides of a rectangle.

four



Extra Question #6: Literature – British Literature

10 points per part

The narrator of this poem refers to the title phrase as “the old lie,” and indicates that one should not tell it to “children ardent for some desperate glory.”		
1	Name this war poem that describes the dropping of Five-Nines, and the immediate impact on a group of soldiers “knock-kneed, coughing like hags.”	<u>“Dulce et Decorum est”</u>
2	This poet of “Dulce et Decorum Est” described the monstrous anger of the guns replacing passing-bells for those who die as cattle in “Anthem for Doomed Youth.”	Wilfred <u>Owen</u>
3	Wilfred Owen was among the “War Poets” who fought in this major conflict, along with Siegfried Sassoon and Rupert Brooke. Ernest Hemingway and E.E. Cummings both volunteered as ambulance drivers during this conflict.	<u>World War I</u> [accept <u>Great War</u>]

Extra Question #7: Literature – British Literature

10 points per part

The narrator of this poem proclaims “beauty is truth, truth beauty.”		
1	Name this poem dedicated to a piece of pottery that is called a “Sylvan historian” and a “foster child of silence and slow time.”	<u>“Ode on a Grecian Urn”</u>
2	This author of “Ode on a Grecian Urn” describes a knight-at-arms “alone and palely loitering” in “La Belle Dame Sans Merci.”	John <u>Keats</u>
3	Keats wrote two long works about this titan who fathered Helios.	<u>Hyperion</u>



Extra Question #8: Math – Algebra

10 points per part

This concept is often represented by a lemniscate [LEM-nuh-scate].		
1	Name this concept often confused for a number. This concept represents the ability of some quantities to grow without bound.	<u>infinity</u> [or <u>infinite</u>]
2	This mathematician studied different types of infinities and developed the idea of transfinite numbers.	Georg <u>Cantor</u>
3	The set of all numbers divisible by both 6 and 8 is an infinite set equivalent to the set of all numbers divisible by what value?	<u>24</u>

Extra Question #9: Math – Algebra

10 points per part

There are several unsolved problems in mathematics.		
1	One of the Millennium Prize Problems asks whether all of the nontrivial zeros of this mathematician’s zeta function have a real part equal to one-half.	Bernhard <u>Riemann</u> [or <u>Riemann</u> conjecture or <u>Riemann</u> zeta function]
2	This mathematician conjectured to Euler that every even integer greater than two can be expressed as the sum of two primes. Over two hundred years later, we still do not know if he is correct.	Christian <u>Goldbach</u> [or <u>Goldbach</u> ’s conjecture]
3	This is the only pair of prime numbers that adds up to twelve.	<u>5</u> and <u>7</u> [either order, accept answers such as 5+7]



Question #1: Science – Biology

10 points

This man may have stolen one of his discoveries from **Jean [zhahn]** Joseph Henri **Toussaint [too-sahn]**, performing a well-publicized demonstration in **Pouilly-le-Fort [pul-lee leh for]**, and he used a similar discovery to save the life of Joseph Meister. This scientist simplified a process developed by Lazzaro Spallanzani and Nicolas Appert that was used on alcoholic drinks. This scientist is credited with developing vaccines for rabies and anthrax and for explaining fermentation. Identify this namesake of a process of food preservation.

Louis Pasteur

Question #2: Literature – Mythology

10 points

The mother of this god was the eldest of the **Pleiades [PLEE-ah-dees]**. One of the gods welcomed by **Baucis [BAW-sis]** and **Philemon [FIL-uh-mon]**, he gave **Odysseus [oe-DIS-see-us]** moly to counter the magic of **Circe [SIR-see]**. The father of **Autolycus [aw-TOE-lie-kus]** and Pan, he invented the lyre shortly after stealing Apollo's cattle. Born to Maia in a cave on Mount **Cyllene [suh-LEE-nee]** this psychopomp lent Perseus his cap and sandals. Name this Greek god of those who live by their wits, such as travelers and merchants.

Hermes [accept Mercury]



Question #3: Social Studies – U.S. History

10 points

This court case was initiated thanks to George **Rappelyea [RA-pul-yay]**, and the initial result was overturned on account of Judge John Raulston, not the jury, setting the \$100 fine. Initiated by a violation of the Butler Act, the prosecuting attorney was questioned on the witness stand with regards to his interpretation of the Bible. William Jennings Bryan supported the prosecution, while the defendant was represented by Clarence Darrow. Name this event in which a Tennessee science teacher was prosecuted for teaching evolution.

Scopes Monkey Trial [accept *State of Tennessee v. Scopes*]

Question #4: Miscellaneous – Pop Culture

10 points

This performer sang about a “cold and gray Chicago morning” and its effects on a poor child. A career comeback by this singer included a recording of “Suspicious Minds.” On another track, this singer described how being in love made him “all shook up.” Managed by Colonel Tom Parker, this star of *G.I. Blues* and *Blue Hawaii* derided an animal’s inability to catch rabbits in “Hound Dog” and described a party thrown by the warden in “Jailhouse Rock.” Name this “King of Rock ’n Roll” who lived at Graceland.

Elvis Aaron Presley [accept either underlined part]



Question #5: Science – Astronomy

10 points

In 1992, the **Ulysses [yoo-LIS-sees]** spacecraft did a flyby of this planet, and in 2007 the New Horizons probe made a flyby of this planet. This planet's gossamer rings include one associated with the moon **Thebe [THEE-bee]** and another associated with **Amalthea [ah-mahl-THAY-uh]**. This planet has a strong magnetic field due to sulfur dioxide coming from volcanoes on one of its moons and this planet's liquid metallic hydrogen. Its four largest moons were seen by Galileo and include **Ganymede [GA-nuh-meed]**. Name this planet featuring the Great Red Spot, the largest planet in our solar system.

Jupiter

Question #6: Literature – British Literature

10 points

This person wrote a story in which Sabrina was summoned by the Attendant Spirit to free a Lady that had been stuck to a chair. In a speech before Parliament, this writer quoted **Euripides [yoo-RIH-puh-dees]** in defending the "liberty of unlicensed printing." This author of *Comus* and *Areopagitica [ah-ree-oe-pah-JIH-tih-kah]* wrote of the **Stygian [STIH-jee-un]** Council meeting within a chamber of Pandemonium. Along with a sequel to his most famous poem, this person wrote *Samson Agonistes [a-goe-NIS-tees]*. Name this blind English poet who wrote, "Of man's first disobedience" in "Paradise Lost."

John Milton



Question #7: Math – Probability

10 points per part

Answer these questions about rolling two standard dice.		
1	This adjective describes the fact that when you roll two dice, the result of one die does not have any relationship on the result of the other one. Because of that, the two rolls have this type of relationship.	<u>independent</u> [accept word forms such as <u>independence</u> , do not accept “dependent”]
2	If you roll two standard dice, what is the probability of rolling a sum of exactly six?	<u>5/36</u> [or <u>0.138 repeating</u>]
3	If you roll two dice, what is the probability that at least one of the dice will have a six on top?	<u>11/36</u> [or <u>0.305 repeating</u>]

Question #8: Math – Probability

10 points per part

One pair of events with this relationship is the event currently snowing outside and the event currently hot outside.		
1	Give this two-word phrase that describes pairs of events that cannot both happen in the same experiment.	<u>mutually exclusive</u>
2	If Events A and B are both mutually exclusive and collectively exhaustive, and Event A has a probability of 0.3, then what is the probability of Event B?	<u>0.7</u> [or <u>seven-tenths</u>]
3	If Events C and D are mutually exclusive, Event C has a probability of 0.2, and Event D has a probability of 0.4, then what is the probability of Event D if Event C does not happen?	<u>0.5</u> [or <u>one-half</u>]



Question #9: Social Studies – Psychology

10 points per part

This experiment was designed to get around the flaws of Muzafer Sherif’s [MOO-zah-fer SHAH-reef’s] autokinetic [aw-toe-kih-NEH-tik] experiment.	
1	Identify this experiment named for a psychologist in which a number of participants at Swarthmore College intentionally gave the wrong answer to a question involving the lengths of lines.
2	The experiments of Sherif and Asch were meant to test this tendency to go along with a group’s belief or behavior, even when it is clearly wrong.
3	Solomon Asch was also a pioneer of this German school of psychology in the United States. Holding that the whole is more than merely the sum of its parts, it can be broken down into principles of proximity, similarity, and continuity.

Asch Experiment [accept mentions of **conformity**, but do not mention it]

conformity [accept word forms]

Gestalt

Question #10: Social Studies – Psychology

10 points per part

The opponent-process theory involving this sense breaks down elements into three opposing pairs.	
1	The trichromatic theory of this sense instead identifies three specific wavelengths by which all colors are made.
2	A common demonstration of the opponent-process theory is through an image of this object depicted with a yellow field, black stars, and green and black stripes. The afterimage depicts this object in its usual form.
3	People with this condition are able to combine senses in unique ways, such as “seeing colors” or “tasting sounds.”

vision [accept **sight** or other equivalents]

flag of the **United States** [prompt on partial answers]

synesthesia [si-nuhs-THEE-shuh]



Question #11: Science – Physics

10 points per part

This value can be calculated by multiplying half of mass times the square of speed.		
1	Name this energy of motion.	<u>kinetic</u> energy
2	This principle named for a Swiss scientist uses the conservation of the total of kinetic, potential, and pressure energy to find the speed of a fluid.	<u>Bernoulli</u> 's principle [accept other additional words]
3	This operator used in Schrodinger's equation is formed by adding the kinetic and potential energy operators.	<u>Hamiltonian</u>

Question #12: Science – Physics

10 points per part

Answer the following about objects that spin or move in circles.		
1	This is the name of the inward acceleration of an object that moves in uniform circular motion.	<u>centripetal</u> acceleration
2	This value can be calculated by adding mass times distance squared from the rotational axis for every point on an object.	mass <u>moment of inertia</u> [or <u>rotational inertia</u> or polar <u>moment of inertia</u> or <u>angular mass</u> , prompt on <u>I</u> , do not accept "inertia"]
3	A charged object in a magnetic field will follow a circular path if the radius times charge times magnetic field strength equals this value for the object.	linear <u>momentum</u> [accept <u>mass times velocity</u> or equivalents, but do not accept "mass" or "velocity" individually]



Question #13: Literature – World Literature

10 points per part

This playwright was the first to extensively use the <i>parabasis</i> [pa-rah-BAY-sis] to touch on current topics.		
1	Name this “Old Comedy” dramatist who described the women of Greece withholding sex from their husbands in order to end the Peloponnesian [peh-luh-puh-NEE-shun] War in <i>Lysistrata</i> [lie-sih-STRAH-tah].	<u>Aristophanes</u>
2	In this Aristophanes [a-rih-STAH-fuh-nees] play, Socrates [SAH-kruh-tees] teaches at the Thinkery, which was attacked by a mob led by Strepsiades [strep-SEE-ah-dees] following the transformation of Phidippides [fih-DIH-pih-dees].	<i>The <u>Clouds</u></i> [accept <u>Nephelai</u>]
3	This philosopher cited Aristophanes’ caricature in his <i>Apology</i> .	<u>Plato</u>

Question #14: Literature – World Literature

10 points per part

After death, he made his home in the Groves of Blessedness.		
1	Name this character whose son tried thrice in vain to embrace his spirit. While alive, he was crippled for revealing that he slept with a goddess.	<u>Anchises</u> [an-KAYS-us] [be generous in accepting pronunciations]
2	While Troy was being sacked by the Greeks, Anchises [an-KIE-sees] was carried out of the city on the back of this son and epic hero.	<u>Aeneas</u> [ay-NEE-us]
3	Aeneas was the hero of the <i>Aeneid</i> , written by this Roman.	Publius <u>Virgilius</u> Maro



Question #15: Fine Arts – Art History

10 points

Yves Klein created one shade of this color for his paintings. Jonathan Buttall was painted wearing a coat of this color. The guitar is the only item not painted this color in *The Old Guitarist*. Kandinsky showed a man wearing this color on a horse in a painting of a "Rider" that gave its name to an expressionist movement. Name this color that names an early Picasso period and a painting of a boy by Thomas Gainsborough.

blue

Question #16: Social Studies – Economics

10 points

Welfare loss occurs when this value is set above the market-clearing level. For Veblen and Giffen goods, this value is directly proportional to its demand. In a perfect monopoly, this value will be set at the point where marginal revenue equals zero. Changes in this quantity are classified as deflation or inflation. This value is often set by a seller, but not during an auction, and a buyer can change this value by haggling. Name this economic value, the amount of money a consumer pays for a good.

price [accept cost]



Question #17: Science – Chemistry

10 points

These chemicals are classified as high temperature shifts or low temperature shifts in the water-gas shift reaction. Carl Bosch once bought lots of osmium because osmium can be used as one of these chemicals in the Haber process. **Vanadium [vuh-NAY-dee-um]** oxide is used for this purpose while creating sulfuric oxide. These chemicals sometimes work by lowering activation energies, and these chemicals play the same role that **enzymes [EN-zimes]** do in biological reactions. Name these chemicals that increase the rate of a reaction without being consumed in it.

catalysts [do not accept “enzyme”]

Question #18: Literature – U.S. Literature

10 points

Inspired by the sinking of the SS *Commodore*, this author wrote a story in which the poem “Bingen on the Rhine” inspired a correspondent. This writer used the pseudonym Johnston Smith for the initial print run of a novel about a “pale thing with no spirit” from the Bowery, *Maggie: A Girl of the Streets*. Name this author of “The Open Boat” who wrote about the travails of Jim Conklin and Henry Fleming in his Civil War novel *The Red Badge of Courage*.

Stephen Crane



Question #19: Math – Math Concepts

10 points

<p>The Wilcoxon signed-rank test determines whether a hypothesized value for this quantity is accurate. The cumulative distribution function at this value for a given distribution equals one-half. This value is represented by a segment drawn in the middle of a box-and-whisker plot. If the cardinality of a finite distribution is even, then this value is found by taking the mean of two numbers. Give this number equal to the fiftieth percentile of a distribution so that about half the values are bigger and half the values are smaller than this quantity.</p>	<p><u>median</u></p>
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Question #20: Social Studies – World History

10 points

<p>This monarch utilized “progresses” in touring various parts of her realm. This ruler described the love of her subjects as “more than any treasure or riches” in her Golden Speech. The target of the Babington Plot, her forces were victorious against the Spanish Armada. This monarch was the predecessor of James the First and successor to Bloody Mary. Name this final Tudor monarch who was nicknamed the Virgin Queen when she ruled England.</p>	<p><u>Elizabeth I</u> of England [prompt on <u>Elizabeth</u>]</p>
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Question #21: Fine Arts – Classical/Opera

10 points per part

In this ballet, Odile [oe-deel] is magically disguised by her father Von Rothbart to look like Odette, who has been cursed to take the form of a bird.		
1	Name this tragic ballet about Prince Siegfried's failed attempt to break the spell on Odette.	<u>Swan Lake</u>
2	This composer of <i>Swan Lake</i> also composed the ballets <i>The Sleeping Beauty</i> and <i>The Nutcracker</i> .	Peter Ilyich Tchaikovsky [chie-KOF-skee]
3	<i>Swan Lake's</i> first act includes one of these dances in three four time being held at Prince Siegfried's birthday. Tchaikovsky wrote one for the snowflakes in <i>The Nutcracker</i> .	<u>waltz</u>

Question #22: Fine Arts – Classical/Opera

10 points per part

The aria “Ombra mai fu” from <i>Serse</i> [SEHR-say] was intended to be sung by a castrati [kah-STRAH-tee] in this vocal range, which also includes coloratura [kuh-luh-ruh-CHUR-uh] and lyric variants.		
1	Name this vocal range, which is the highest pitched vocal range. Francesca Cuzzoni [frah-CHES-kah coo-ZOE-nee] was a popular Italian one in Baroque-era London, and Renee Fleming is a modern one.	<u>soprano</u>
2	This composer's fights with the soprano Francesca Cuzzoni included him lifting her up by the waist and threatening to throw her out of a window during a rehearsal. He composed <i>Serse</i> and <i>Messiah</i> .	George Friedrich <u>Handel</u>
3	The aria “Ev'ry Valley shall be exalted” from <i>Messiah</i> was set for this kind of male singer, whose range is higher than a baritone.	<u>tenor</u>



Question #23: Math – Algebra

10 points per part

This allows the equation of any line that is not vertical to be expressed with only two parameters and with only one multiplication and one addition.		
1	Name this form for the equation of a line that is typically written as y equals m x plus b .	<u>slope-intercept</u> form
2	Find the x -intercept of a line if its equation in slope-intercept form is y equals two x plus eight.	<u>-4</u> [or <u>(-4,0)</u> , do not accept “4”]
3	If the line with equation y equals negative one x plus four is tangent to a circle centered at the origin, find the radius of the circle.	<u>2 Root 2</u> [or <u>2 times the square root of 2</u> or <u>2 radical 2</u> or equivalents]

Question #24: Math – Algebra

10 points per part

This type of relationship does not involve any addition or subtraction, and it can be called a proportional relationship.		
1	Name this relationship whose direct type is based on the equation y equals k times x and whose indirect type is based on the equation y equals k divided by x , where k is a constant.	<u>variation</u> (accept word forms such as <u>vary</u> or <u>varies</u> , do not accept “variance”)
2	If y varies inversely with x , and y equals ten when x equals ten, then what is the value of y when x equals two?	<u>50</u>
3	If y varies inversely with x squared, and y equals ten when x equals ten, then what is the value of y when x equals two?	<u>250</u>



Question #25: Social Studies – World History

10 points per part

Its nominal ruler was the last Ching emperor Puyi, who was brought out of retirement for the purpose of ruling this state.		
1	Name this state whose invasion was preceded by the Mukden [mook-den] Incident.	<u>Manchukuo</u> [man-choo-kwoe] [or <u>Manchuria</u>]
2	The Mukden Incident provided this country with a pretext for invading mainland China. This country set up the puppet state of Manchukuo thanks in part to the Kwantung Army.	Empire of <u>Japan</u> [or <u>Nippon</u> -koku or <u>Nihon</u> -koku]
3	The Kwantung Army was stationed on Port Arthur, which Japan gained control of as part of the 1905 Treaty of Portsmouth with this other nation.	<u>Russia</u> [do not accept <u>Soviet Union</u>]

Question #26: Social Studies – World History

10 points per part

The second of these conflicts is sometimes named for the <i>Arrow</i> , a ship which was allegedly involved in piracy and smuggling.		
1	Name these conflicts which saw China forced to open its economy to Western powers, as well as the legalization of the trade of a particular plant.	<u>Opium</u> Wars
2	The treaty to end the First Opium War was signed in this city; it saw Hong Kong come under British control. During the Sino-Japanese War, the capture of this city was followed by the wholesale massacre of the local population, in what became known as the “Rape of” this city.	<u>Nanking</u> [accept <u>Nanjing</u>]
3	The Treaty of Tianjin, which ended the Second Opium War, opened up this city to foreign diplomats. Upon the establishment of the People’s Republic of China, it was tapped as the capital.	<u>Beijing</u> [accept <u>Peking</u>]



Question #27: Literature – British Literature

10 points per part

He used his son Linton to gain control of Thrushcross Grange, with the help of Mr. Green.		
1	Name this “dirty, ragged, black-haired child” who was taken from the streets of Liverpool. After the death of his adoptive father, he was abused by Hindley.	<u>Heathcliff</u>
2	Heathcliff exacted revenge by gaining control of the title estate in this novel.	<u>Wuthering Heights</u>
3	This author of <i>Wuthering Heights</i> described “ten thousand mingled rays of suns that know no winter days” in “To Imagination.”	Emily <u>Brontë</u> [or <u>Ellis Bell</u> , prompt on <u>Brontë</u> or <u>Bell</u>]

Question #28: Literature – British Literature

10 points per part

After being captured, he contemplates numerous circumstances by which he could procure a razor blade.		
1	Name this character who is told that “life will defeat him.” During his time in Room 101, he was attacked by rats as part of his torture.	<u>Winston Smith</u> [accept either]
2	Winston Smith was arrested for thought-crime in this dystopian novel.	<u>Nineteen Eighty-Four</u>
3	This author of <i>Nineteen Eighty-Four</i> utilized his experience in Burma when writing the story “Shooting an Elephant.”	George <u>Orwell</u> [accept Eric Arthur <u>Blair</u>]



Question #29: Science – Physics

10 points

Henry Kater made a reversible version of this device to accurately measure gravitational field strength. The gridiron was used to correct for the expansion of these devices in clocks. Galileo performed many experiments on these devices, finding that their masses and displacement amplitudes were unimportant, though in fact large amplitudes change their periods. The rotation of the Earth was demonstrated by a large device of this type designed by **Foucault [foo-cahl]**. The period of these devices varies with the square root of length. Name these devices that consist of a mass hanging from a string.

pendulums

Question #30: Literature – World Literature

10 points

Almost committing suicide on the eve of Easter, this character later translated the Greek “logos” as “deed.” Victorious in a duel with Valentin, he had earlier been transformed via the spell “Hexen-**Einmaleins [ayn-mah-layns]**.” During a festival, this character sees the image of Medusa as resembling the woman he loves, Gretchen. Adrian Leverkühn is a modern version of this character, who was also the subject of a Charles **Gounod [goo-noe]** opera. Name this scholar who makes a deal with **Mephistopheles [meh-fih-STO-feh-lees]** in a work by **Goethe [GUR-tah]**.

Heinrich Faust



Question #31: Math – Math Concepts

10 points

This solid is covered by a triple integral in which x goes from the negative square root of one minus y squared to the square root of one minus y squared, y goes from negative one to one, and z has constant endpoints. The lateral part of this solid is generated by rotating a horizontal segment around the x -axis, and the lateral part consists of all points the same distance from a segment without going beyond the end of the segment. The surface area of this solid can be calculated by adding the area of a rectangle and two circles. Name this solid that consists of two parallel circles and the space between them.

right circular cylinder

Question #32: Social Studies – U.S. History

10 points

This president's Executive Order 9981 abolished racial discrimination in the armed services, and his National Security Council issued Report 68 supporting containment during the Cold War. His proposals regarding the Fair Employment Practices Act and the repeal of the Taft-Hartley act were part of his "Square Deal." Supporting populations being targeted by armed minorities or outside forces, with specific references to Greece and Turkey, became his namesake doctrine. He authorized the use of the atomic bomb on Hiroshima and Nagasaki. Name this last vice president under Franklin Roosevelt who in 1948 defeated Thomas Dewey.

Harry S Truman



Extra Question #1: Science – Biology

10 points

A tumor in this gland causes Cushing’s disease from the increased secretion of ACTH. Located in the sella **turcica** [**TER-kih-kah**] in the sphenoid bone, this gland secretes but does not produce **oxytocin** [**ok-see-TOE-sin**]. This gland does produce some sex hormones such as LH and FSH. Some diseases of this gland can cause people to be an unusual size because it produces growth hormone. This gland also secretes thyroid-stimulating hormone. Name this gland at the bottom of the hypothalamus in the brain.

pituitary gland [or **hypophysis** or **anterior pituitary**]

Extra Question #2: Literature – U.S. Literature

10 points

This object was compared to one worn by Joseph Moody, of York, Maine. Mr. Clark of Westbury attempted to remove this object while its owner was on his deathbed. This object consisted of two folds of crape, and its owner indicated that “no mortal eye will see it withdrawn.” Name this title object of a Nathaniel Hawthorne tale, owned by Reverend Hooper.

The Minister’s Black **Veil** [accept equivalents, as the question asks for the object, not the title]



Extra Question #3: Math – Math Concepts

10 points

<p>For these shapes, the sum of the distances from any interior point to the sides is less than half the combined distances from the point to the vertices according to the Erdős-Mordell Inequality. A line drawn through one of these shapes with an extended side produces a product of three length ratios equal to negative one according to Menelaus' theorem. These shapes have an Euler [OY-ler] line that goes through their orthocenter, circumcenter [SIR-kum-sen-ter], and centroid. Name these shapes whose areas can be found by multiplying one-half times their base times their height.</p>	<p>triangle [accept more specific answers]</p>
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Extra Question #4: Fine Arts – Classical/Opera

10 points

<p>In both volumes of one of his keyboard works, preludes and fugues are played in all 24 keys in order to demonstrate a tuning system. An aria da capo repeats the theme at the end of one of his sets of variations. This composer of the <i>English</i> and <i>French Suites</i> composed as educational material his two-part inventions and 3-part sinfonias. Name this Baroque composer of <i>The Goldberg Variations</i> and <i>The Well-Tempered Clavier</i>.</p>	<p>Johann Sebastian Bach</p>
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Extra Question #5: Social Studies – World History

10 points

<p>Emily Hobhouse spoke out against the utilization of concentration camps in this conflict. Sparked by the discovery of gold in Witwatersrand, and the subsequent rush of Uitlanders [OIT-lan-ders], in the build-up to it, an uprising did not result from the Jameson Raids. Resulting in the annexation of the Orange Free State and Transvaal, name this conflict between British colonizers and local South Africans.</p>	<p>Second Anglo-<u>Boer</u> War</p>
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Extra Question #6: Social Studies – U.S. History

10 points per part

This man initially nominated his second vice-president as Minister to England, but the Senate rejected it.		
1	Name this president whose first vice president resigned over the nullification crisis. During his first term, his entire Cabinet resigned, including Secretary of War John Eaton.	Andrew <u>Jackson</u>
2	After defeating the Creeks, Jackson invaded Florida in 1816 and fought against this collective group of Native Americans that also included escaped slaves.	<u>Seminoles</u>
3	Jackson’s actions against the Seminole in Florida led to this 1819 treaty, by which Spain ceded the territory to the United States.	<u>Adams-Onis</u> Treaty

Extra Question #7: Social Studies – U.S. History

10 points per part

Per his doctrine, any country could request foreign aid if it was the target of armed military aggression.		
1	Name this creator of the “atoms for peace” program who warned against the creation of a “military-industrial complex.”	Dwight David <u>Eisenhower</u>
2	In both of his victorious Presidential elections, Eisenhower defeated this former Illinois governor, who would later be tapped as JFK’s Ambassador to the UN.	Aldai E <u>Stevenson</u> II
3	Between serving as president of Columbia University and running for election, Eisenhower was tapped to head this international organization as Supreme Commander.	<u>North Atlantic Treaty Organization</u> [accept <u>NATO</u>]



Extra Question #8: Science – Chemistry

10 points per part

These elements have very low reactivity.		
1	Give the nickname that applies to Group 18 elements, which make up the rightmost column of the periodic table.	<u>noble</u> gases
2	The decay chain from uranium to lead includes this noble gas. The radiation when this element and its daughters decay is blamed for many cases of lung cancer.	<u>radon</u>
3	A different isotope of radon comes from the decay of this element. This element is bombarded with neutrons in some nuclear reactors to make uranium.	<u>thorium</u>

Extra Question #9: Science – Chemistry

10 points per part

This process drives reactions by attracting different ions to the anode and the cathode.		
1	Name this process of chemical change caused by a direct current.	<u>electrolysis</u>
2	This English scientist discovered several elements, including calcium and magnesium, by using electrolysis.	Sir Humphry <u>Davy</u>
3	Magnesium combines with this ion to form Epsom salt.	<u>sulfate</u> [or <u>SO₄²⁻</u>]



Question #1: Social Studies – U.S. Government

10 points

<p>This action taken against William Blount set the precedent that Congressmen are not “civil officers,” and cannot undergo it. This action was taken one time following a lawsuit by Paula Jones that was described in a report by Kenneth Starr. Seven “Republican Recusants [ree-KYOO-sunts]” swung the outcome of one attempt at this action, as it requires a two-thirds vote of the full Senate to be successful. Occurring based on allegations of treason, bribery, or high crimes and misdemeanors, name this act of legally attempting to throw the President of the United States out of office.</p>	<p><u>impeachment</u> [accept word forms]</p>
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Question #2: Miscellaneous – Agriculture

10 points

<p>This is the common name for species of the Triticum [TRIH-tih-kum] genus. Bulgur [bool-GUR] is made from soaking and cooking this grain. This plant’s namesake nematode [NEE-muh-tode], also called an ear cockle, can also affect rye grasses. Stinking smut is a seedborn fungal disease that affects this crop. Its kernels consist of a bran, endosperm, and germ. Taken to mills for grinding into flour, name this plant often used in cereals and breads.</p>	<p><u>wheat</u></p>
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Question #3: Science – Chemistry

10 points

Because heat and mass favor locations where this value is high, different values of this quantity in different areas cause the **Marangoni [MEHR-un-goe-nee]** effect. This quantity represented by the greek letter gamma is lowered by fire fighting foams. Measured in units of either force per length or energy per area, this quantity can be measured with a du **Nouy [noy]** ring. Caused by a combination of adhesion and cohesion, this value varies directly with the height of capillary action. This quantity can impact measurements due to its impact on the meniscus. Name this tendency of liquids to stay together.

surface tension [prompt on tension]

Question #4: Literature – U.S. Literature

10 points

This person wrote of a dead soul revisiting her twelfth birthday before declaring that the living “don’t understand.” One of his characters allegedly became “conceited and stuck-up” through his baseball talent; that teen later scrapped plans to go to agricultural school. This person wrote a play about Emily Webb and George Gibbs set in Grover’s Corners that is narrated by the Stage Manager. Name this author of *The Bridge of San Luis Rey* and *Our Town*.

Thornton Niven Wilder



Question #5: Social Studies – World History

10 points

This location's constitution called for five annually-elected **ephors [EH-furs]** that carried out day-to-day business. Following the Corinthian War, this city was named Guardian of the Peace. Twenty-eight citizens over age sixty were elected to its Council of Elders, along with two co-rulers, who arbitrated during times of war. This city was defeated by **Thebans [THEE-buns]** at the Battle of **Leuctra [LOOK-trah]**. Warriors from this city were helped by **Demophilus [deh-MO-fih-lus]** when they lost to the Persians at **Thermopylae [ther-MAH-puh-lee]** under the leadership of **Leonidas [lee-AH-nuh-dus]**. Name this city-state that fought in the Peloponnesian War against Athens.

Sparta [accept **Lacedaemon**]

Question #6: Science – Astronomy

10 points

Scientists are trying to determine whether **ultraluminous [ul-trah-LOO-mih-nus]** x-ray sources are intermediate-mass examples of these objects. All known examples of these objects are currently classified as stellar or supermassive. The region Sagittarius A Star is believed to contain a supermassive example of these objects near the center of the Milky Way. These objects exist within their Schwarzschild radius, and there is debate as to whether they emit Hawking radiation from their event horizons. Name these objects that do not allow light to escape.

black holes



Question #7: Math – Geometry

10 points per part

Regular versions of this polygon have internal angles that measure 135 degrees.		
1	Name these polygons also known as eight-gons.	<u>octagons</u>
2	If an octagon's internal angles are each less than 180 degrees, then it has this property in which any segment connecting two points inside the octagon is entirely inside the octagon.	<u>convex</u>
3	How many diagonals does a convex octagon have?	<u>20</u>

Question #8: Math – Geometry

10 points per part

When two of these segments intersect, the power of a point can be used to calculate the lengths of their parts.		
1	Name these segments whose endpoints are on a circle.	<u>chords</u>
2	This is the longest chord in a given circle.	<u>diameters</u>
3	If the diameter of a circle is twelve units, find the length of a chord that subtends an arc of sixty degrees in the circle.	<u>6</u> units



Question #9: Fine Arts – Musical Theater

10 points per part

This musical opens with an auction where a chandelier that was thrown from a ceiling is being sold.		
1	Name this musical, where Christine Daaé [dah-AY] sings “Angel of Music” to her vocal teacher, who drags her down to a lake underneath a theater and sings “The Music of the Night,” before Christine looks behind his mask and sees his deformed face.	<i>The <u>Phantom of the Opera</u></i>
2	<i>The Phantom of the Opera</i> was composed by this musical theater writer, who also composed its sequel <i>Love Never Dies</i> , along with the musicals <i>Cats</i> and <i>Evita</i> .	The Right Honourable Lord Andrew Lloyd Webber [prompt on Webber]
3	The Phantom of the Opera is set in the Palais Garnier [pa-lay gahr-nyay] in this city, which really does have a lagoon in its basement.	Paris , France

Question #10: Fine Arts – Musical Theater

10 points per part

This musical's film version opens with the declaration that “The hills are alive” with the title concept.		
1	Name this musical where the nun-in-training Maria becomes governess for the children of Georg [jorj] and teaches them to sing songs, including “Do-Re-Mi” and “The Little Goatherd.”	<i>The <u>Sound of Music</u></i>
2	Oscar Hammerstein wrote the book to <i>The Sound of Music</i> , and its music was composed by this man, who also wrote the music for <i>Oklahoma!</i>	Richard Rodgers
3	The Sound of Music centers around this Austrian noble family, who in real life fled Austria to become a musical act in Stowe, Vermont.	von Trapp family [accept von Trapps , prompt on Trapps]



Question #11: Science – Biology

10 points per part

Alleles [uh-LEELS] with this type of trait are symbolized by a capital letter.		
1	Name these traits that are expressed in phenotypes when the genotype either is homogeneous for the trait or is heterogeneous.	autosomal <u>dominant</u> [or <u>dominance</u>]
2	These diagrams named for a British geneticist are used to show the possible outcomes when two organisms with known genotypes are bred.	<u>Punnett square</u>
3	This neurological disorder sometimes confused with Parkinsonism is characterized by involuntary movements called chorea [kuh-REE-uh]. This is an autosomal [aw-tuh-SOE-mul] dominant inherited disease.	<u>Huntington</u> 's disease [or <u>Huntington</u> 's chorea]

Question #12: Science – Biology

10 points per part

The skeletal types of these structures connect to bones at tendons.		
1	Name these structures that include biceps and triceps.	<u>muscles</u>
2	Some muscles are classified as smooth, and others are given this classification based on bands of color caused by sarcomeres.	<u>striated</u>
3	The sarcomeres exist between dark lines named for this letter.	<u>Z</u>



Question #13: Literature – Mythology

10 points per part

This Lydian [LIH-dee-un] weaver paid a price for portraying the extramarital affairs of Zeus.		
1	Name this woman who hung herself, but was transformed into a spider with the aid of aconite [A-kuh-nite].	<u>Arachne</u> [uh-RAK-nee]
2	Arachne's [uh-RAK-nee's] suicide followed the destruction of her loom by this goddess, whom she challenged to a weaving contest.	<u>Athena</u> [accept <u>Minerva</u>]
3	In that contest, Athena depicted her victory over this god for control of the city of Athens. She offered the city an olive tree, in contrast to his creation of the Spring at the Acropolis.	<u>Poseidon</u> [accept <u>Neptune</u>]

Question #14: Literature – Mythology

10 points per part

She created a poisoned robe that brought about the deaths of both Creusa [kray-OO-sah] and King Creon [KREE-on].		
1	Name this mythological witch and murderer of Absyrtus. After killing Creusa and Creon, she fled on a chariot drawn by winged dragons.	<u>Medea</u>
2	Medea fell for this leader of the Argonauts, and she helped him procure the Golden Fleece.	<u>Jason</u>
3	After killing King Pelias of Iolcus [eye-OL-kus], Jason and Medea settled in this city, home of Creusa and Creon and founded by Sisyphus [SIH-suh-fus].	<u>Corinth</u>



Question #15: Math – Math Concepts

10 points

Three of these objects named for Euler [OY-ler] are used to give the orientation of a solid object. The azimuthal [a-zih-MEH-thul] or zenith type of this object is used in spherical coordinates. Pierre Wantzel proved that it is impossible to trisect these entities with a compass and straightedge. If a pair of these objects differ by a multiple of a revolution, they are coterminal. If one of these objects is inscribed in a circle, it has half the measure of the included arc. If a pair of these objects adds up to a straight line, the pair is supplementary. Name these objects consisting of two rays with a common endpoint.

angles

Question #16: Fine Arts – Art History

10 points

This person drew a weeping image of the pregnant Clasina Hoornik, known as Sien [seen], in his work *Sorrow*. He painted a *Wheat Field with Cypresses*, and he also painted a *Wheat Field with Crows*. He corresponded extensively with his art dealing brother Theo. This person painted a portrait of Dr. Gachet [ga-shay], and he showed the Rhone river illuminated by the night sky in another work. Some of his self-portraits show a bandage over his ear. Name this artist of *Starry Night*.

Vincent van Gogh



Question #17: Literature – World Literature

10 points

This story features a painting of a woman in a fur hat, scarf, and muffs that the protagonist tries to hold on to. In this story, a sibling initially provided the protagonist with milk and bread before giving him rotted scraps. That sibling later plays the violin for her family and three boarders; the protagonist's appearance at that recital ultimately results in his death. Name this story in which Gregor Samsa turns into an insect, written by Franz Kafka.

The Metamorphosis [accept *Die Verwandlung*]

Question #18: Science – Physics

10 points

The type of welding named for this phenomenon uses two pieces, one of which rotates. A **tribometer** [trie-BAH-meh-ter] measures this phenomenon, one type of which consists of hanging variable weights from one end of a pulley. The coefficient of this phenomenon has static and kinetic varieties, and that coefficient is commonly multiplied by the normal force. That coefficient can be decreased by adding lubricants, and this force can be reduced by using ball bearings. Name this force that, like drag, is opposed to motion.

friction



Question #19: Social Studies – U.S. History

10 points

<p>With Silas Deane and Arthur Lee, this person negotiated the Treaty of Alliance that secured French support during the American Revolution. He was the first Postmaster General under the Continental Congress. The man behind the columns of Silence Dogood in the <i>New England Courant</i>, this supporter of the Albany Plan designed the “Join or Die” cartoon. Name this founding father who allegedly used a Leyden [LIE-den] jar and a key to discover electricity.</p>	<p>Benjamin <u>Franklin</u></p>
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Question #20: Literature – British Literature

10 points

<p>This person wrote about a ring that would summon Azrael if it was turned three times; that ring was owned by King Solomon. This person wrote of a fictional invention of the alphabet in “How the First Letter was Written”. He wrote of an Ethiopian painting himself black before performing the title action in “How the Leopard Got His Spots”. One of his poems is set, “on the road to Mandalay,” and his poem about what it takes to be a man is titled “If”. Name this author whose story of the mongoose Rikki-tikki-tavi is found within “The Jungle Book.”</p>	<p>Rudyard <u>Kipling</u></p>
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Question #21: Science – Chemistry

10 points per part

When this value is less than 7, a solution is considered acidic [uh-SIH-dik].		
1	Name this value calculated by taking the opposite of a common log of a concentration.	pH
2	The pH [pee aitch] is a measure of how much of this ion with chemical formula H₃O⁺ [aitch three oe plus] is in a solution.	hydronium [or hydroxonium]
3	Because concentration is difficult to measure, the chemical activity of hydronium is used to find pH. This equation, which gives the reduction potential of half cells, helps to find the chemical activity.	Nernst equation

Question #22: Science – Chemistry

10 points per part

This is the SI [ess eye] unit for amount of substance.		
1	Name this unit based on a number of molecules equal to Avogadro's number.	mole
2	Though the standard for a mole is now based on carbon twelve, it used to be common to use the isotope of this element with atomic mass number sixteen.	oxygen [prompt on O]
3	This law states that the mole fraction of a gas dissolved in a liquid varies directly with the partial pressure of the gas over the liquid.	Henry's law



Question #23: Social Studies – U.S. History

10 points per part

This abolitionist served as a conductor on the Underground Railroad before founding the more militant League of Gileadites [GIH-lee-uh-dites] .		
1	Name this man who took the name Isaac Smith as part of a plan that ended with his hanging at Charles Town after his raid was stopped by marines under Robert E. Lee.	John <u>Brown</u>
2	John Brown was convicted of treason for leading an attack on the arsenal in this town to gain arms for a slave insurrection.	<u>Harpers Ferry</u>
3	In response to the sacking of Lawrence, Kansas, John Brown and his sons got revenge on five residents of this town.	<u>Pottawatomie</u> Creek

Question #24: Social Studies – U.S. History

10 points per part

Despite the territory gain of the Gadsden Purchase, the second of these projects was not completed until 1881.		
1	Name this project whose first construction had its eastern terminus at Council Bluffs and went through the Clipper and Emigrant Gaps, as well as Donner Pass in northern California.	<u>Transcontinental Railroad</u>
2	The completion of the Transcontinental Railroad was celebrated at this location in Utah. A golden spike was ceremonially hammered in here by Leland Stanford.	<u>Promontory</u> Point [or <u>Promontory</u> Summit]
3	Following the end of the Civil War, the portion of the track from east to west was built under the supervision of this company, headed by Thomas Durant. The scheme enveloped Congress, and implicated Vice President Schuyler Colfax.	<u>Credit Mobilier</u>



Question #25: Math – Pre-Calculus

10 points per part

For these functions, whenever p is greater than q, then f of p is greater than f of q.		
1	Name the adjective used for functions that have positive derivatives.	strictly increasing [accept word forms]
2	This type of extremum exists where a function changes from increasing to decreasing.	local maximum [prompt on local]
3	Give the x-coordinate of the maximum of the function y equals negative two x squared plus twenty x plus seven.	5

Question #26: Math – Pre-Calculus

10 points per part

This type of graphing system is often used for cardioids [KAHR-dee-oids] and limacons [lee-mah-sones].		
1	Name this two dimensional system in which the coordinates represent distance from a fixed point and rotation angle from a fixed direction.	polar coordinates
2	This name is given to the fixed point, which plays a role similar to the origin in rectangular coordinates.	pole
3	Find the area of the shape generated by the polar coordinate equation r equals two. Ignore units.	four pi [or equivalents, do not accept partial answers]



Question #27: Literature – British Literature

10 points per part

He owns a painting by Jean-Baptiste Greuze [zhahn bap-teest grooz], which he could not have afforded on his salary alone.		
1	Name this teacher of mathematics and author of <i>The Dynamics of an Asteroid</i> . He supplements his pay by offering his services as a consulting criminal.	Professor James Moriarty [prompt on James]
2	James Moriarty is the arch-nemesis of this detective, created by Sir Arthur Conan Doyle.	Sherlock Holmes [prompt on Sherlock]
3	In “The Final Problem,” Holmes gets the best of Moriarty, who fell to his death from atop the Reichenbach Falls in this European country.	Switzerland [or Swiss Confederation or Helvetica]

Question #28: Literature – British Literature

10 points per part

This burgess [BUR-jis] was later tapped to serve as a judge and reporter.		
1	This host derided a man’s incessant rhyming in telling a story concerning Sir Thopas. He suggested the prize of dinner to one who told a story “of best sentence and most solace.”	Harry Bailey [accept either]
2	Harry Bailey led a group of pilgrims towards Canterbury, as they planned to visit this man’s shrine. His murder is a key plot point in T.S Eliot’s <i>Murder in the Cathedral</i> .	Saint Thomas a Becket [prompt on Becket]
3	This author fictionalized himself as the teller of the tales of Sir Thopas and Melibee in <i>The Canterbury Tales</i> .	Geoffrey Chaucer



Question #29: Science – Biology

10 points

<p>The formation of scar tissue in this organ can be called Asherman syndrome. The two outer layers around this organ are the myometrium [mie-oe-MEE-tree-um] and perimetrium [per-uh-MEE-tree-um]. This organ is the site of endometrial cancer, and it contains a functional layer that changes in thickness based on the growth of blood vessels that are influenced by progesterone [proe-JES-ter-one] and estrogen. The lowest part of this organ is the cervix [SIR-viks], and the upper part is connected to the fallopian tubes. Name this organ in women that houses a fetus during pregnancy.</p>	<p><u>uterus</u></p>
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Question #30: Social Studies – World History

10 points

<p>The Battle of Ammunition Hill was fought in this city, where Folke Bernadotte was assassinated. Baldwin the First became the first “King of” this city, as Godfrey of Bouillon refused the title. Its’ “Old City” is home to the al-Aqsa mosque. The Six-Day War was fought over control of this city, as Jordan used to control its eastern half and the neighboring West Bank. This city was the target of the First and Third Crusades. Name this city that Israel considers to be its capital.</p>	<p><u>Jerusalem</u> [accept <u>Yerushalayim</u>, <u>Bayt al-Muqaddas</u> or al-<u>Quds</u>]</p>
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Question #31: Literature – U.S. Literature

10 points

<p>Compared to the wall that a prisoner must thrust through to reach outside, the Shaker Gabriel believes that this figure is God incarnate. Boomer lost an arm to it, and it was the hearse that was prophesied by Fedallah. This creature made a “hearse of American wood” out of the <i>Pequod</i> [PEE-kwod]. This animal is pursued by Captain Ahab in a novel by Herman Melville. Name this white whale.</p>	<p><u>Moby-Dick</u> [prompt on the White “Whale”]</p>
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Question #32: Math – Math Concepts

10 points

<p>Cobham’s thesis states that problems with big O in the complexity class named for this type of function can be feasibly completed, and this complexity class is at the center of the P versus NP problem. These functions can be used to approximate other functions using a McLaurin series or a Taylor series. These functions can be differentiated using the sum rule and power rule. Possible solutions to equations with these functions can be limited by the rational root theorem, and these functions can be divided using synthetic division. Name these functions that include trinomials and monomials.</p>	<p><u>polynomial</u>s [prompt on “power series”]</p>
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Extra Question #1: Literature – World Literature

10 points

Acting against nature is considered violence in this poem, in which nature is called “the grandchild of God.” In this poem, baptism is called “the portal of the faith that you embrace.” One beast in this work has his three mouths filled with mud. Prior to entering the primary location for this poem, a gate is seen with the inscription “abandon all hope, ye who enter here.” Name this collection of cantos detailing a journey through Hell by Dante [DAHN-tay].

Inferno [prompt on *The Divine Comedy*]

Extra Question #2: Science – Health

10 points

People allergic to this food are also usually allergic to birch pollen and mugwort pollen. A controversy has developed because the United States allows this food to be treated with DPA to prevent storage scald, but the European Union does not. Like cherries, peaches, and apricots, the seeds of this food contain amygdalin [uh-MIG-duh-lin], which can be converted into cyanide [SIE-uh-nide]. The juice of this food was the first source of malic acid. Name this fruit whose varieties include the Baldwin, honeycrisp, golden delicious, and the Granny Smith.

apples



Extra Question #3: Fine Arts – Composers of Modern Era

10 points

This person composed a Hebrew setting of biblical poems in his *Chichester Psalms*. His *MASS* prompted surveillance from Nixon's administration. His three symphonies are nicknamed "Jeremiah," "The Age of Anxiety," and "Kaddish." He conducted a performance of Beethoven's Ninth symphony that replaced the word "Joy" with "Freedom" soon after the Berlin Wall fell, and he was the New York Philharmonic's conductor. Name this composer who wrote the music for pieces such as "I Feel Pretty" and "Maria" in a musical about street gangs, *West Side Story*.

Leonard Bernstein [or Louis Bernstein]

Extra Question #4: Math – Math Concepts

10 points

The fact that the eversion of these shapes is possible was proven by Stephen Smale. One construct in this shape can map to the complex plane plus a point at infinity. The Kepler problem asks how little space can be taken up by a set of these shapes, which is also known as their packing. This shape can be generated in a system of graphing by setting the variable rho equal to a constant. The intersection of this shape and a plane through its center is its great circle. Name this three-dimensional shape consisting of all the points the same distance from the center.

spheres



Extra Question #5: Social Studies – U.S. History

10 points

This state was the subject of the Willey Amendment, which followed the creation of a “Reorganized Government.” It won a court case involving the supervision of the counties of Berkeley and Jefferson, shortly after it was formed via the Wheeling Convention. Its Winding Gulf Coalfield was nicknamed the Billion Dollar Coalfield. This state was formed when it broke away from the state to its east during the Civil War. Name this state whose capital is Charleston.

West Virginia



Extra Question #6: Math – Trigonometry

10 points per part

Angles in this quadrant are acute angles.		
1	In which quadrant are both the sine and cosine functions positive?	<u>1</u> [or <u>1st</u>]
2	If an angle in the first quadrant has a sine of $\frac{3}{5}$, what is its cosine?	<u>$\frac{4}{5}$</u> [or <u>0.8</u>]
3	Find the cotangent of that same angle.	<u>$\frac{4}{3}$</u> [or <u>1 $\frac{1}{3}$</u> or <u>1.3 repeating</u>]

Extra Question #7: Math – Trigonometry

10 points per part

This function gives the ratio of the side length of a leg opposite to an angle divided by the side length of a leg adjacent to an angle.		
1	Name this function represented as y divided by x for a point on the unit circle.	<u>tangent</u>
2	What is the tangent of the quantity three pi over four radians?	<u>-1</u> [do not accept 1]
3	If you graph the tangent function with the input given in radians, what is the period of the function?	<u>pi</u> radians



Extra Question #8: Social Studies – World History

10 points per part

Some important people have ended up with their heads under water.		
1	The Lombard League was victorious over this “red-bearded” ruler at the Battle of Legnano [leh-NYA-noe]. While journeying in the Third Crusade, he tried to swim across a river in full armor, but drowned.	<u>Frederick I</u> [accept <u>Frederick Barbarossa</u> , prompt on <u>Frederick</u>]
2	This “holy man” and confidant of czarina Alexandra was poisoned with cyanide, then shot and beaten, before being bound and thrown into a river.	Grigory Efimovich <u>Rasputin</u>
3	According to Herodotus, this “great” Persian king and father of Cambyes [kam-BEE-sis] the Second met his match in Queen Tomyris, who followed through on her threat to “give him his fill of gore” and dipped his head into a bowl of blood.	<u>Cyrus</u> the Great [or <u>Cyrus II</u> or <u>Cyrus the Elder</u>]

Extra Question #9: Social Studies – World History

10 points per part

Made a commander following the death of his brother-in-law Hasdrubal, this leader first drew the ire of Rome by capturing Saguntum.		
1	After Rome declared war and sent forces to Sicily, he took his forces and elephants, and went across the Pyrenees and Alps en route to Rome.	<u>Hannibal</u> [accept <u>Hanba'al</u>]
2	Hannibal was a key leader for this city-state in the Second Punic War.	<u>Carthage</u>
3	At this 216 battle on the Italian east coast, Hannibal’s arched line was able to absorb the Roman attack before encircling and destroying them.	Battle of <u>Cannae</u>



Question #1: Social Studies – World History

10 points

<p>Recruited to assassinate Abdul Karim Qasim [kah-REEM kah-SEEM], this person fled to Egypt after the failed attempt. Under Ahmad Hasan al-Bakr [BAHK-ur], he oversaw the nationalization of his country's oil industry, and would later succeed al-Bakr as President. Operation Desert Fox was a result of this premier's refusal to work with UN arms inspectors. His ordered invasion of Kuwait touched off the Persian Gulf War. Name this former dictator overthrown in Operation Iraqi Freedom.</p>	<p>Saddam <u>Hussein</u> Abd al-Majid al-Tikriti</p>
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Question #2: Science – Biology

10 points

<p>One example of these compounds was discovered in 2002 in a <u>methanosarcina</u> [MEH-thuh-noe-sahr-SEE-nah] organism. One of these compounds is changed into <u>melatonin</u> [meh-luh-TOE-nin] by a four-step process, and 29 of these compounds are combined to form <u>glucagon</u> [GLOO-kah-gon]. These compounds contain a <u>carboxylic</u> [kahr-bok-SIL-ik] acid functional group and a nitrogen atom bonded to two hydrogen atoms. Examples of these compounds that must be in the human diet are classified as essential. Name these compounds that form chains of polypeptides, which are combined to form proteins.</p>	<p><u>amino acids</u></p>
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Question #3: Miscellaneous – Industrial Arts

10 points

Processing this substance involves mastication inside a Banbury chamber. Most of the material used in its natural form is sourced from *Hevea brasiliensis* [HEE-vee-uh brah-SIL-yen-sis] trees. When exposed to sulfur for an extended period, this substance turns into ebonite [EE-boe-nite]. Commonly consisting of isoprene [EYE-soe-preen], this substance contains elastomers. Sulfur is also used to enhance its resilience through vulcanization. This substance is often made by refining latex. Name this elastic material, most commonly seen in vehicle tires and pencil erasers.

rubber [prompt on latex]

Question #4: Math – Math Concepts

10 points

In the napkin ring problem, this quantity does not depend upon the size of the sphere. This quantity is surprisingly finite for Gabriel's horn. For a **parallelepiped** [pa-ruh-leh-leh-PIE-ped], this quantity can be calculated with a triple product. For figures created by rotation, this quantity can be calculated using the washer method or cylindrical shells. When each side of a solid is doubled, this quantity is multiplied by eight. Name this quantity of three-dimensional space, equal to length times width times height for a rectangular prism.

volume



Question #5: Literature – British Literature

10 points

<p>This person wrote a play in which Trotter pretended to be a policeman before outing himself as George Corrigan. Another of this writer’s characters would lean on Sir Henry Clithering when in need of official information; that character appeared in the <i>Three Blind Mice</i> collection along with a man who feigned his death to attack “The Big Four.” This writer’s <i>The Thirteen Problems</i> featured the detective Miss Marple. Name this creator of Hercule Poirot [ur-kyool pwahr-oe] and author of <i>Murder on the Orient Express</i>.</p>	<p>Agatha <u>Christie</u></p>
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Question #6: Science – Earth Science

10 points

<p>In these structures, the mineral aragonite [uh-RAG-uh-nite] often forms into anthodites [AN-thoe-dites]. Many of these structures are classified as solutional and are surrounded by dolomite or limestone. The longest example of these structures contains the Echo River and is located in the Green River valley in Kentucky. The study of these structures is called speleology [spee-lee-OL-uh-jee], and these structures contain stalactites and stalagmites. Name these hollow openings in rocks in the Earth’s surface that are large enough for people to enter.</p>	<p><u>caves</u> [or <u>caverns</u>]</p>
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Question #7: Social Studies – Current Events

10 points per part

During the summer of 2014, a number of riots broke out in a suburb of St. Louis following an altercation between a teenager and a police officer.		
1	Name this town in which Officer Darren Wilson shot Michael Brown in controversial circumstances.	<u>Ferguson</u> , Missouri
2	In the aftermath, this Attorney General announced that the Justice Department would launch a civil rights probe regarding the entire Ferguson Police Department. In September 2014, this person announced that he would step down when his successor was approved.	Eric <u>Holder</u> , Jr.
3	When it was announced that the case involving Darren Wilson was going to a grand jury, protesters called for the holder of this post, Jay Nixon, to remove Robert McCulloch as prosecutor.	<u>Governor</u> of Missouri

Question #8: Social Studies – Current Events

10 points per part

In November 2014, President Obama went to this country to sign a deal on carbon emissions.		
1	Name this most populous country in the world.	People’s Republic of <u>China</u> [or <u>PRC</u>]
2	When Congressional leaders criticized the agreement, the Obama Administration announced that it could be enforced under this law originally passed in 1963 and strengthened in 1970, the year that the Environmental Protection Agency was created.	<u>Clean Air</u> Act
3	This Senate Republican leader from Kentucky, who had just defeated Alison Lundergan Grimes, immediately announced his opposition to the deal.	Mitch <u>McConnell</u>



Question #9: Science – Physics

10 points per part

In chemistry, a change in this condition is covered by Le Chatelier's [shaht-lee-ay's] Principle.		
1	Name this condition in physics which commonly refers to a situation in which the mechanical conditions of a rigid body do not change.	equilibrium [accept more specific answers]
2	In this type of mechanical equilibrium, a minor stress on the system is countered by forces that restore the system back to the equilibrium.	stable equilibrium
3	Two or three dimensional systems can be stable in one direction but unstable in another direction. In such cases, this is the name of the point that exists on a graph of the potential energy function.	saddle point [or hyperbolic point]

Question #10: Science – Physics

10 points per part

This constant equals the ratio between energy and frequency according to explanations of the photoelectric effect.		
1	Name this constant represented by a lower case h.	Planck 's constant
2	The Planck constant is divided by this value to get the reduced Planck constant, which is also known as the Dirac constant.	two pi [do not accept partial answers]
3	One method for finding Planck's constant involves measuring this effect that involves a current crossing an insulator between two superconductors.	Josephson effect



Question #11: Literature – World Literature

10 points per part

The protagonist of this novel was believed by Detective Fix to be a bank robber.		
1	Name this novel in which a consortium of Misters Stuart, Fallentin, Sullivan, Flanagan, and Ralph wagered that the title feat could not be accomplished.	<u><i>Around the World in Eighty Days</i></u> [accept <i>Le <u>tour du monde en quatre-vingts jours</u></i>]
2	This protagonist of <i>Around the World in Eighty Days</i> was accompanied on the trek by his valet Passepartout [pass-par-too].	<u>Phileas Fogg</u> [accept either]
3	This author of <i>Around the World in Eighty Days</i> wrote of the exploits of Captain Nemo in <i>Twenty Thousand Leagues Under the Sea</i> and <i>The Mysterious Island</i> .	Jules <u>Verne</u>

Question #12: Literature – World Literature

10 points per part

Laurent [luh-ron] was employed as the servant of this con artist.		
1	Name this character who took on a religious air in order to get into the good graces of Orgon.	<u>Tartuffe</u> [prompt on “L’imposteur,” “The Imposter,” or “The Hypocrite”]
2	Tartuffe [tahr-toof] was created by this French playwright of <i>The Misanthrope</i> . This writer died while performing the role of Argan in <i>The Hypochondriac</i> .	<u>Moliere</u> [accept Jean-Baptiste <u>Poquelin</u>]
3	Tartuffe’s schemes were undone after this enlightened king who is unnamed in the play was informed of what happened. In real life, this king headed France for 72 years.	King <u>Louis XIV</u> [or the <u>Sun</u> King or le Roi- <u>Soleil</u>]



Question #13: Math – Trigonometry

10 points per part

This type of symmetry is exhibited by functions whose graphs are symmetric about the y-axis.		
1	Name this type of symmetry for functions that give the same output for any input value or the additive inverse of that input value.	<u>even</u>
2	Of the six basic trigonometry functions, these two exhibit even symmetry.	<u>cosine</u> and <u>secant</u> [either order]
3	Find the secant of negative sixty degrees.	<u>2</u>

Question #14: Mathematics – Trigonometry

10 points per part

This adjective applies to all trigonometric functions.		
1	Name these functions for which f of x equals f of the quantity x plus p for a given value of p and all values of x .	<u>periodic</u> functions
2	Horizontal shifts of periodic functions are known as these types of shifts.	<u>phase</u> shifts [or <u>phase</u> offset or <u>phase</u> difference]
3	Find the phase shift for the function f of x equals the sine of the quantity four x minus three.	<u>3/4</u> [or <u>0.75</u> , accept an additional description of positive or to the right, do not accept negative or to the left]



Question #15: Social Studies – Geography

10 points

<p>In Chapter 10 of his book, Daniel had a vision by this river, the third branch from the river found within Eden. The Mosul Dam re-routes waters from this river. Fed by the Greater and Lesser Zab, it is one of the feeders of the Shatt al-Arab, which forms part of the Iran/Iraq border. Flowing through Baghdad, name this river that, along with the Euphrates [yoo-FRAY-tees], defined Mesopotamia.</p>	<p><u>Tigris</u> River</p>
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Question #16: Fine Arts – Classical/Opera

10 points

<p>Charles Hanon wrote 60 exercises for this instrument, and Carl Czerny wrote etudes [eh-toods] for it in <i>The School of Velocity</i>. Robert Schumann's <i>Kreisleriana</i> [KRISE-lehr-ee-ah-na] was written for this instrument and performed on it by Vladimir Horowitz. Other performers on this instrument include Sergei Rachmaninoff [rok-MAH-nee-nof] and Van Cliburn. This instrument's soundboard helps to project the noise of felt padded hammers striking steel strings. Bartolomeo Cristofori is credited with its invention, and Pleyel [play-el] and Steinway are companies that produce these instruments, which can be upright, baby, or concert grand. Name this keyboard instrument that has 88 white and black keys.</p>	<p><u>piano</u>forte</p>
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Question #17: Literature – World Literature

10 points

<p>This person wrote about a woman who provided a pistol to a former lover, then burned that man's manuscript. This playwright wrote of Judge Brack's blackmail that led to the suicide of a title character. He also wrote of a macaroon-loving wife of a bank employee who walked out on her husband, Torvald Helmer. Contaminated baths were the subject of this writer's play <i>An Enemy of the People</i>. The creator of Nora Helmer and Hedda Gabler, name this author of <i>A Doll's House</i>, a Norwegian playwright.</p>	<p>Henrik Johan <u>Ibsen</u></p>
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Question #18: Science – Chemistry

10 points

<p>Though it is made of lead sulfide, galena is often found with valuable amounts of this element. The chloride of this element is known as the horn form of this element. Halides [HA-lides] of this element, which are produced from its nitrates, are used to make photographic film. This metal has both the highest thermal and electrical conductivity of all elements. This element tarnishes in the presence of hydrogen sulfide, and copper is added to this element to produce its sterling type. Name this metal whose Latin name is Argentum [ahr-JEN-tum].</p>	<p><u>silver</u></p>
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Question #19: Social Studies – U.S. History

10 points

<p>This politician used the slogan “the full dinner pail” during his successful presidential re-election campaign, while utilizing his front porch to great effect in winning his first term. He earned the moniker “Napoleon of Protection” following the passage of his tariff, which is cited as a key driver of the Panic of 1893. Name this president during the Spanish-American War whom Leon Czolgosz [chole-goesh] shot in Buffalo, resulting in Teddy Roosevelt becoming President.</p>	<p>William <u>McKinley</u></p>
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Question #20: Literature – Mythology

10 points

<p>In the court of Lycomedes [lie-koe-MEE-dees], this character disguised himself as Pyrrha [PEER-uh] before having an affair with Deidamia [die-DA-mee-uh], through which he fathered Neoptolemus [nee-op-TOH-leh-mus]. After Briseis [bree-SAIS] was taken from him, this man refused to fight in the Trojan War until the death of Patroclus. He allowed Priam to take the corpse of Hector following his desecration of it. His mother Thetis [THAY-tis] dipped him in the River Styx. Name this Greek mythical hero who was immortal, except for his heel.</p>	<p><u>Achilles</u></p>
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Question #21: Math – Algebra

10 points per part

This number is the mean lifetime multiplied by the natural log of two, and it is also equal to the natural log of two divided by the decay constant.		
1	Name this measure of rate of decay of an object.	<u>half-life</u>
2	If the half-life of an object is ten hours, how long will it take for an original amount to decay to one-sixteenth of its original amount? Include units.	<u>40 hours</u> [prompt on <u>40</u>]
3	Round your answer to the nearest integer. If you begin with 100 grams of substance, and the half-life is an hour, how many grams will be left after a half hour? You need to round to the nearest integer.	<u>71</u> grams

Question #22: Math – Algebra

10 points per part

Consider the graph of the equation y equals the square root of x.		
1	What is the name of the shape formed by the graph? The graph only forms half of this shape.	<u>parabola</u> [accept answers such as half a parabola]
2	Find the average slope of that graph between x equals zero and x equals sixteen.	<u>1/4</u> [or <u>0.25</u>]
3	Find the slope of the tangent line to the graph at x equals sixteen.	<u>1/8</u> [or <u>0.125</u>]



Question #23: Social Studies – U.S. History

10 points per part

This merger took place in 1955, and the resulting organization was run for over two decades by George Meany.		
1	Name this combination of unions that was the dominant force in organized labor for fifty years.	<u>AFL-CIO</u> [or <u>American Federation of Labor</u> and <u>Congress of Industrial Organizations</u>]
2	In 1957, the AFL-CIO expelled the Teamsters when this leader refused to step down. This person’s son currently heads the Teamsters.	James Riddle “Jimmy” <u>Hoffa</u>
3	For over thirty years, Albert Shanker headed the AFL-CIO member union that represents people in this profession.	American Federation of <u>Teachers</u> [accept answers such as <u>education</u>]

Question #24: Social Studies – U.S. History

10 points per part

There have been some limits placed on the First Amendment, including a famous dictum written by Oliver Wendell Holmes in <i>Schenck v. US</i> .		
1	Holmes asserted that the most stringent protections of free speech would not protect someone who falsely shouted this word in a movie theater.	<u>“fire”</u> [accept equivalents]
2	In 2006, Orrin Hatch’s constitutional amendment that would have banned the burning of this object failed by one vote in the Senate.	the <u>flag</u> of the United States of America [accept equivalents]
3	In protesting the Vietnam War, David O’Brien was convicted of burning this item.	<u>draft card</u> [accept <u>registration certificate</u>]



Question #25: Fine Arts – Art History

10 points per part

On the right of this painting, a woman holds a black parasol and a monkey on a leash, and she stands next to a man in a top hat.		
1	Name this painting of people enjoying a day off at an island in the Seine.	A <u><i>Sunday Afternoon on the Island of La Grande Jatte</i></u> , 1884 [or <u><i>Un dimanche après-midi à l'Île de la Grande Jatte</i></u> , 1884 or A <u><i>Sunday on La Grande Jatte</i></u> ; accept Isle in place of Island]
2	<i>A Sunday Afternoon on the Island of La Grande Jatte</i> was painted using this technique, where a number of tiny dots of color are combined to create an image.	<u>pointillism</u> [accept word forms]
3	This pioneering pointillist painted <i>A Sunday Afternoon on the Island of La Grande Jatte</i> .	Georges <u>Seurat</u>

Question #26: Fine Arts – Art History

10 points per part

A pair of altarpieces for the Cathedral of Our Lady in Antwerp show this man before and after his death.		
1	Name this man who is shown being elevated, then descending from the cross.	<u>Jesus Christ</u> (accept either answer)
2	This man painted the altarpieces showing <i>The Elevation</i> and <i>Descent from the Cross</i> . This painter also depicted large sea maidens attending the ceremony when Marie de Medici [MEH-deh-chee] disembarked at Marseilles [mahr-say].	Peter Paul <u>Rubens</u>
3	Rubens painted the ceiling of the Banqueting House at Whitehall in this English city, where Westminster Palace can be found.	<u>London</u>



Question #27: Literature – British Literature

10 points per part

After conquering Poland, this character encounters a scene of great death along with ambassadors from England.		
1	This nephew of Old Norway is “of unimproved mettle hot and full,” according to Horatio [huh-RAY-shee-oe].	Fortinbras [FOR-tin-bras]
2	Fortinbras ordered four of his captains to bear this deceased Danish prince like a soldier. Before his death, this character struck Laertes [lay-EHR-tees] with a poison-tipped sword, and forced his uncle to drink poisoned wine.	Hamlet
3	The English ambassadors who arrived with Fortinbras had come to relay the news that these two spies were dead.	Rosencrantz and Guildenstern [either order]

Question #28: Literature – British Literature

10 points per part

The reader first encounters this character in a counting-house, with heaps of gold before him.		
1	This Jew used his daughter Abigail to turn Lodowick and Mathias against each other. He helped the Turks take over Malta, before double-crossing the invaders.	Barabas [prompt on Jew of Malta]
2	Barabas is the titular Jew of Malta in a play by this Elizabethan playwright of <i>The Tragical History of Doctor Faustus</i> .	Christopher Marlowe
3	The prologue to <i>The Jew of Malta</i> is narrated by a ghost inspired by this Italian political theorist who praised the actions of Cesare Borgia in <i>The Prince</i> .	Niccolo Machiavelli



Question #29: Science – Physics

10 points

The eddy type of this quantity explains why a magnet falls slower through a metallic tube. In the **Biot-Savart** [bee-yoe suh-vahr] law, this quantity is multiplied by the differential of length, which is crossed with displacement and divided by displacement cubed. This quantity is multiplied by permeability and divided by two pi times radius to find the strength of a magnetic field. This quantity can be measured with a galvanometer, and it equals potential difference divided by resistance. Name this quantity equal to charge per time that is measured in Amperes.

electric current [prompt on I]

Question #30: Social Studies – World History

10 points

Ranulf de Blondville oversaw the re-issuance of this agreement by King Henry the Third. Pope Innocent the Third futilely declared this agreement to be null and void. This document states, “To no one will we sell, to no one will we deny, or delay right or justice.” The First Barons’ War immediately followed its issuance. Its Article 25 outlined the “Great Council,” and it served as precedent for the legal right of *habeas corpus*. Signed at **Runnymede** [RUN-nee-meed] in 1215, name this legal document that curtailed the powers of the English monarchy.

Magna Carta Libertatum [accept Great Charter of the Liberties of England]



Question #31: Math – Math Concepts

10 points

The derivative of the inverse of this function is one over the square root of the quantity one minus x squared. For small values of x, this function can be approximated as x minus the quantity x cubed over six. This function is multiplied by *i* in DeMoivre's [de-mahv's] theorem. The double angle formula for this function multiplies twice this function times its cofunction. This function is the reciprocal function of cosecant. Name this function equal to the y-coordinate on the unit circle and equal to opposite over hypotenuse in a right triangle.

sine [accept **arcsine** before the end of the second sentence, do not accept "cosine"]

Question #32: Literature – U.S. Literature

10 points

This person wrote about a pilot who went missing in action off the coast of China, likely due to a suicide revealed in a letter sent to Annie. Joe Keller escaped imprisonment for making faulty engine cylinder heads in his play *All My Sons*. In another play by this writer, Betty accuses Abigail of drinking blood to kill John Proctor's wife. This playwright drew on the history of the Salem Witch Trials for *The Crucible*. Name this dramatist who wrote of the travails of the Loman family in *Death of a Salesman*.

Arthur Asher **Miller**



Extra Question #1: Social Studies – U.S. History

10 points

The losing side at this battle was delayed by the funeral of Asa Pollard and also suffered the key loss of Dr. Joseph Warren. The HMS *Lively* fired the opening shots of this battle, fought on the Charleston Peninsula. Described by Henry Clinton as a **pyrrhic [PEER-ik]** victory, this battle saw Israel Putnam issue the order "don't fire until you see the whites of their eyes." Name this victory for the British on Breed's Hill.

Battle of **Bunker Hill** [prompt on **Breed's Hill**]

Extra Question #2: Math – Math Concepts

10 points

This number is equal to half the Wallis product, which is every even number multiplied twice divided by every odd number multiplied twice. This number equals twice the object length divided by the quantity mark spacing times probability in Buffon's needle experiment. An exponential function is divided by the square root of twice the variance times this number to normalize a bell curve. This number became known as **Archimedes [ahr-kuh-MEE-dees]** constant after he tried to approximate it. This is the number of radians equivalent to 180 degrees. Identify this ratio of a circle's circumference to its diameter equal to approximately 3.14.

pi



Extra Question #3: Fine Arts – Art History

10 points

<p>One of these items shows a "Child with Toy Hand Grenade in Central Park" and was created by Diane Arbus. A shirtless Indian man next to his spinning wheel was the subject of one of these items. Margaret Bourke-White used these to create portraits of Gandhi. A <i>Moon and Half Dome</i> in Yosemite [yoe-SEH-muh-tee] was captured in one of these works. Name these images that Ansel Adam often made, which are created when a real life scene is captured by a camera.</p>	<p><u>photographs</u></p>
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Extra Question #4: Science – Physics

10 points

<p>The maximum value of this quantity before damage occurs equals shear stress times torsion constant divided by size. A tool that multiplies this quantity uses epicycle [EH-pih-sie-kul] gears. This quantity is equal to a magnetic moment crossed with a magnetic field. This quantity is integrated with respect to angle to calculate work, and this quantity equals moment of inertia times angular acceleration. A formula to calculate this quantity sets it equal to "r" cross "F". Name this rotational analog of force.</p>	<p><u>torque</u></p>
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Extra Question #5: Literature – U.S. Literature

10 points

This work's speaker decries those whose "first and chief concern...is seeing that the almshouses are in good order." Questioning the crucifixion of Christ, as well as the excommunication of Luther and Copernicus, in its opening line, the narrator accepts the motto "that government is best which governs least." Written while the author was jailed for refusing to pay a poll tax, name this tract by Henry David Thoreau about defying the government.

"On the Duty of **Civil Disobedience**" [accept "**Resistance to Civil Government**"]



Extra Question #6: Science – Biology

10 points per part

This biome exists near the North and South Poles.		
1	Name this area where trees are rare and the ground is often frozen.	<u>tundra</u>
2	Tundras are home to this composite organism that includes a fungus and an organism capable of photosynthesis.	<u>lichen</u>
3	Marmots, which are this type of rodent, are able to survive alpine tundra conditions.	<u>squirrel</u> [or <u>sciuridae</u> or <u>xerinae</u>]

Extra Question #7: Science – Biology

10 points per part

The allopatric type of this process occurs when the populations are separated.		
1	Name this process during which population differences grow to the point at which they can no longer interbreed.	<u>speciation</u> [accept word forms or explanations involving the creation of a new species]
2	Darwin developed his theories on speciation when it was found that these birds taken from various Galapagos islands were separate species.	Darwin's <u>finches</u>
3	Name the type of speciation that takes place with both populations living in the same region.	<u>sympatric</u>



Extra Question #8: Literature – U.S. Literature

10 points per part

In putting on a particular event by this man, one guest was said to have “out-Heroded Herod.”		
1	Upon seeing that guest, this man demanded that the guest reveal himself, such that he could be hung from the battlements.	Prince <u>Prospero</u>
2	Prince Prospero hosted a masquerade ball for those seeking to evade the title affliction in this short story.	“The <u>Masque of the Red Death</u> ”
3	“The Masque of the Red Death” was written by this author of “The Tell-Tale Heart.” He wrote about the late editor of the Goosetherumfoodle in “The Literary Life of Thingum Bob, Esquire.”	Edgar Allan <u>Poe</u>

Extra Question #9: Literature – U.S. Literature

10 points per part

When confronted about taxes owed to the city of Jefferson, she instructed the authorities to see Colonel Sartoris, who had been dead for a decade.		
1	Name this long-time teacher of china-painting who used rat poison to kill a former construction foreman.	Miss <u>Emily</u> Grierson [accept “A <u>Rose for Emily</u> ”]
2	Emily Grierson was created by this author who wrote about the Compson brothers in <i>The Sound and the Fury</i> .	William Cuthbert <u>Faulkner</u>
3	In one tale, Faulkner wrote of Colonel Sartoris Snopes, whose father would burn these structures in order to exact revenge.	<u>barns</u>



Question #1: Literature – Mythology

10 points

<p>In the Valley of the Kings, this god is depicted as the ruler of nine bows. Aided in a primary role by his daughter Kebechet [KEB-chet], this “lord of the necropolis” was, before Osiris [oh-SIE-rus], referred to as the “Foremost of Westerners.” His title of “He Who Counts the Hearts” stems from his role in the weighing of one’s heart after death. Name this Egyptian guardian of the dead, a jackal-headed deity.</p>	<p><u>Anubis</u></p>
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Question #2: Fine Arts – Composers of Modern Era

10 points

<p>One composer from this country wrote <i>Eight Songs For a Mad King</i>. Another composer from this country wrote a series of variations on music from Henry Purcell's [PUR-sel's] Abdelazer [ab-DEL-uh-zer]. That composer's <i>Sea Interludes</i> are part of his opera <i>Peter Grimes</i>. This country is home to Peter Maxwell Davies and the composer of <i>A Simple Symphony</i> and <i>The Young Person's Guide to the Orchestra</i>. A work directly involving two composers from this country is <i>Fantasia on a Theme by Thomas Tallis</i>, which was composed by Ralph Vaughan Williams. Name this home of Royal Albert Hall and Covent Garden where George Frideric Handel composed <i>Music for the Royal Fireworks</i> for King George the Second.</p>	<p>Great <u>Britain</u> [or The <u>United Kingdom</u> of Great Britain and Northern Ireland or The <u>UK</u> or <u>England</u>]</p>
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Question #3: Science – Health

10 points

<p>This device is helpful for patients with left bundle branch block, which may be why recent research shows that it is more helpful for women than men. Researchers working with pigs in 2014 used the gene TBX18 to create one of these devices naturally. These devices are used for patients with a long QRS duration. The natural version of this device is located in the sinoatrial [sie-noe-AE-tree-ul] node and the atrioventricular [ae-tree-oe-ven-TRIH-kyoo-lur] node. These devices can be combined with defibrillators, and they are part of cardiac resynchronization therapy. Name these electrical implants that keep hearts beating.</p>	<p>artificial <u>pacemakers</u></p>
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Question #4: Social Studies – U.S. History

10 points

<p>Operation Mongoose immediately followed this attack's conclusion, as well as an investigation led by Chief of Staff Maxwell Taylor. In its aftermath, many of the members of Brigade 2056 were killed or captured. José Miró Cardona [kahr-DOE-nah] led the Revolutionary Council that backed this plan, which utilized repainted B-26 bombers. Taking place mostly on Giron [hee-RONE] Beach, this attack was launched from Guatemala shortly after the Kennedy presidency began in 1961. Name this failed attempt to overthrow Fidel Castro.</p>	<p><u>Bay of Pigs</u> invasion [or Invasion de <u>Bahia de Cochinos</u>]</p>
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Question #5: Literature – World Literature

10 points

<p>In one collection, this writer described the authentic expression of war as “blood, suffering and death.” He wrote a story in which the Bashkirs offer a man a thousand rubles for as much land as he can mark out with a spade. This author of “How Much Land Does a Man Need?” used the Battle of Borodino [boe-roe-DEE-noe] as a turning point in the lives of Pierre Bezukhov and Natasha Rostova [roes-TOE-vah]. He also wrote about the lover of Count Vronsky who threw herself under a moving train. Name this author of <i>Anna Karenina</i> and <i>War and Peace</i>.</p>	<p>Lev Nikolayevich “Leo” <u>Tolstoy</u></p>
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Question #6: Science – Physics

10 points

<p>An equation adding a gravitational potential term to equations by Schrodinger and Poisson is partially named for this scientist. The assumption that the time derivative of temperature is proportional to the difference in temperature between an object and the room produces this scientist’s law of cooling. Henry Cavendish provided the first accurate measure of the universal constant this person first imagined, the gravitational constant. Name this scientist whose three laws of motion provided the basis of classical mechanics.</p>	<p>Sir Isaac <u>Newton</u></p>
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Question #7: Fine Arts – Art History

10 points per part

Name these gods who were the subject of lost Greek sculptures.		
1	This God was depicted preparing to kill a lizard in a Praxiteles [prak-sih-TEH-lees] sculpture that gives him the epithet " Sauroktonos [saw-ROK-toe-noes] " in its name. He was also frequently depicted holding his lyre.	<u>Apollo</u>
2	Phidias [FIH-dee-us] created a sculpture of this leader of the gods for his temple at Olympia that was one of the Seven Wonders of the Ancient World.	<u>Zeus</u>
3	This boy deified [DEE-uh-fide] by Hadrian was depicted in many sculptures, including one on display in the Louvre [loov] with empty eye sockets.	<u>Antinous</u> Mondragone

Question #8: Fine Arts – Art History

10 points per part

Marcus Aurelius, Peter the Great, and Erasmo di Narni were depicted riding one of these animals.		
1	Name these animals included in equestrian statues.	<u>horses</u>
2	This nickname of Erasmo di Narni is often used to title the equestrian sculpture portraying him by Donatello.	<u>Gattamelata</u>
3	<i>Gattamelata</i> was the first equestrian statue since Roman times made with this metal, which also was used for the statue of Peter the Great on Nevsky Prospect in St. Petersburg and for Lorenzo Ghiberti's <i>Gates of Paradise</i> .	<u>bronze</u>



Question #9: Literature – U.S. Literature

10 points per part

This poem describes “painted women...luring farm boys.”		
1	Name this poem that extols the title Midwestern city, anthropomorphizing it as a man with “dust all over his mouth, laughing with white teeth.” It also is the source of the epithets “Player with Railroads” and “Stacker of Wheat.”	“ <u>Chicago</u> ”
2	This author of “Chicago” and <i>A Lincoln Portrait</i> also wrote a short poem about fog, describing how it “comes on little cat feet.”	Carl <u>Sandburg</u>
3	In this Sandburg poem, passengers ask the conductor, “What place is this / where are we now?”	“ <u>Grass</u> ”

Question #10: Literature – U.S. Literature

10 points per part

The subject of this poem is “thirty-seven years old in perfect health.”		
1	Name this poem whose narrator claims that “every atom belonging to me as good belongs to you.” The narrator also described grass as “the flag of my disposition,” given a child’s inquiry.	“ <u>Song of Myself</u> ”
2	“Song of Myself” is found within this poet’s <i>Leaves of Grass</i> collection, as well as “When Lilacs Last in the Dooryard Bloom’d,” written in honor of Abraham Lincoln.	Walter <u>Whitman</u>
3	The speaker in this Whitman poem describes how the “expression of the face balks account.” It concludes by declaring that the “thin red jellies” and “the bones and marrow” to be parts of the soul.	“ <u>I Sing the Body Electric</u> ”



Question #11: Science – Biology

10 points per part

These features are found on angiosperms.		
1	Name these parts of plants important in reproduction that typically include colorful petals.	<u>flowers</u>
2	Pollen is germinated at this tip of the flower carpel which is connected to the ovary by the style.	<u>stigma</u>
3	This term is used for the collection of sepals [SEE-puls] that surround the base of a flower.	<u>calyx</u>

Question #12: Science – Biology

10 points per part

This structure includes the medulla oblongata [meh-DULL-uh ah-blon-GAH-tah], pons, and midbrain, but this structure does not include the cerebellum [ser-uh-BEH-lum].		
1	Name the lowest part of the brain.	<u>brainstem</u>
2	These twelve pairs of nerves come directly from the brain. Most of these nerves come from the brainstem.	<u>cranial</u> nerves
3	Extensions of the cranial nerves often include these collections of nerve cells located outside the brain.	<u>ganglia</u> [or <u>ganglion</u>]



Question #13: Social Studies – World History

10 points per part

John Talbot and Thomas Scales oversaw much of the fortification for the losing side at this battle.		
1	Name this attack where, after failing to break the opposing supply line at the Herrings, a diversion allowed a force from Chezy [cheh-zee] to supply the beleaguered French residents.	Siege of <u>Orleans</u>
2	This peasant girl allegedly heard voices that told her to rush to the aid of the dauphin Charles. She was later captured, sold to the English, and burned at the stake.	Saint <u>Joan</u> of Arc [accept <u>Jeanne</u> d'Arc]
3	Following on from Orleans, Joan's forces took a number of cities, including this traditional coronation city. After its capture, Charles VII was crowned here.	<u>Reims</u>

Question #14: Social Studies – World History

10 points per part

This speech decried the borders set by the Vienna Treaties, as well as a number of “missed opportunities” for a coalescence and concentration of power.		
1	Name this oration whose final line derided the “speeches and majority resolutions” of 1848 and 1849 as mistakes.	<u>Blood and Iron</u> speech [or <u>Blut und Eisen</u>]
2	This Prussian statesman behind the Blood and Iron speech later became Chancellor of a unified Germany under the crown of Kaiser Wilhelm I.	Otto von <u>Bismarck</u>
3	In response to the outcry over an Anglo-Portuguese treaty, Bismarck called for a pan-European conference in this city, where European plans for African colonization were laid out.	<u>Berlin</u>



Question #15: Math – Math Concepts

10 points

This adjective can refer to a type of binomial distribution based on the idea of repeating an experiment until a given number of failures occurs. In logic, this term names a function on a statement equivalent to taking its complement. The numbers referred to by this term cause the **signum [SIG-num]** function to give a value other than zero or one, and these numbers are changed by the absolute value function. The cosine function outputs these numbers in the second and third quadrants. Identify this set of the numbers which are less than zero.

negative numbers [or negatives or negation]

Question #16: Social Studies – Religion

10 points

One of this person's followers testified that this person was "foreordained before the foundation of the world." According to one account of his death, soldiers were terrified by an earthquake, and a temple curtain was torn from top to bottom. One of his alternate names refers to the belief that he is the anointed son of King David. After his death, **Longinus [LON-jih-nus]** stabbed his body with a spear. The stories this person told, such as "The Mustard Seed" and "The Prodigal Son", are known as his parables. Name this man who was crucified at Calvary after being betrayed by Judas.

Jesus Christ [prompt on "Messiah," accept Jesus of Nazareth or Jesus of Galilee]



Question #17: Language Arts – Grammar/Usage

10 points

<p>No words of this part of speech are in the novel <i>The Train from Nowhere</i> by Michel Dansel. A valent types of this part of speech lack both a subject and an object. If a preposition or particle is added, a phrasal one is formed. Copulas are often used as their linking types. Inflection is used to add mood and voice to these words. Name this part of speech that conveying a state of being, occurrence, or action.</p>	<p><u>verb</u></p>
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Question #18: Science – Chemistry

10 points

<p>Some scientists claim that the forces named for this person explains the Casimir effect. The surface or envelope named after this person is used to find the volume of a molecule. Examples of the forces named for this person include the Keesom and Debye [deh-BIE] forces. The two constants named for this person, which depend on the molecule being studied, are used to account for molecular volume and forces when explaining the behavior of fluids and gases. Name this Dutch scientist who adjusted the ideal gas law.</p>	<p>Johannes Diderik <u>van der Waals</u> [prompt on <u>Waals</u>]</p>
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Question #19: Social Studies – U.S. History

10 points

This politician's "swing around the circle" speaking tour backfired, losing significant support in the North; he later tried to create an "Army of the Atlantic" to counter significant Congressional opposition. This politician was the only U.S. senator to maintain his position even though he represented a state that seceded. This person's firing of Edwin Stanton was an alleged violation of the Tenure of Office Act; by a single vote he survived the subsequent impeachment. Name this second Vice President under, and successor to, Abraham Lincoln.

Andrew Johnson [prompt on Johnson]

Question #20: Miscellaneous – Journalism

10 points

One host for this network, who was arrested in Minnesota in 2014 for drunkenly yelling at police, is Gregg Jarrett. This network sued satirist Al Franken over his use of their slogan in a book subtitle. Founded by Roger Ailes, this network's coverage of Election Day 2012 saw host Megyn Kelly argue with Karl Rove over the voting in Ohio. Name this cable news network that claims to be fair and balanced, the home to shows hosted by Sean Hannity and Bill O'Reilly.

Fox News Channel [accept FNC, prompt on Fox]



Question #21: Mathematics – Algebra

10 points per part

Their terms are often added together to form a series.		
1	Name these lists of numbers. Examples formed by repeated addition are classified as arithmetic [a-rith-MA-tik], and examples formed by repeated multiplication are classified as geometric.	<u>sequences</u>
2	In this type of process, the value of a number in a sequence depends on previous values.	<u>recursion</u> [accept word forms such as <u>recursive</u>]
3	If each term of a sequence equals the sum of the two previous terms, and if the first two terms equal one, then what is the value of the fourth term?	<u>3</u>

Question #22: Mathematics – Algebra

10 points per part

Several ways to solve linear examples of these entities use matrices.		
1	Name these combinations of equations or inequalities that are typically solved by finding points of intersection.	<u>systems</u> [accept more specific answers]
2	This method for solving systems of equations involves dividing determinants.	<u>Cramer</u> 's rule
3	Find the x-coordinate in the solution to the system of equations in which one equation is two x plus three y equals twelve, and the other equation is x minus three y equals nine.	<u>7</u> [if a y-coordinate is also given, it is -2/3]



Illinois Masonic Academic Bowl
2015 Sectional Tournament

Round # 5
4th Section
Teamwork Questions

Question #23: Social Studies – U.S. Government

10 points per part

The current iteration of this agency was created following the Elixir Sulfanilamide [sul-fuh-NIL-uh-mide] disaster in 1937.		
1	Name this federal body, which regulates tobacco products and ensures proper labeling of cosmetics and supplements.	<u>Food and Drug Administration</u> [accept <u>FDA</u>]
2	A key milestone in the creation of the FDA was this President’s signing of the Pure Food and Drug Act.	<u>Theodore Roosevelt</u>
3	The impetus [IM-peh-tus] for the creation of the Pure Food and Drug Act came from this muckraking novel about the meatpacking industry written by Upton Sinclair.	<i>The <u>Jungle</u></i>

Question #24: Social Studies – U.S. Government

10 points per part

The lawsuit that directly led to this Supreme Court case was filed on behalf of Norma McCorvey.		
1	Name this controversial 1973 ruling in which the majority ruled that a person’s “zone of privacy” extended to decisions regarding marriage, and child-rearing activities.	<u>Roe v. Wade</u> [accept either underlined name]
2	The ruling in <i>Roe v. Wade</i> determined that Texas’ law restricting this action was unconstitutional, as it only made an exception for when the life of the mother was in danger.	<u>abortion</u>
3	In 1992, the Supreme Court established the “undue burden” test regarding abortion restrictions when lawyers representing this reproductive health organization challenged the legality of Pennsylvania’s abortion laws.	<u>Planned Parenthood</u> Federation of America



Question #25: Science – Physics

10 points per part

Some supernovas produce bursts of this type of radiation, and another source is the decay of cobalt into nickel.		
1	Identify this type of radioactivity using a Greek letter. This radiation is more penetrating than alpha or beta radiation.	<u>gamma</u> [accept longer answers]
2	One of the sources of gamma rays in space are these rotating neutron stars.	<u>pulsars</u>
3	This radioactive process that creates a neutron and a neutrino [nue-TREE-noe] sometimes also creates gamma radiation.	<u>electron capture</u>

Question #26: Science – Physics

10 points per part

In the War of the Currents, George Westinghouse favored this type of current.		
1	Name this current that creates a sinusoidal graph when it is graphed versus time.	<u>alternating</u> current [or <u>AC</u>]
2	These devices represented by a coil of wire are used in many AC circuits. These devices are measured in henries.	<u>inductors</u>
3	This is the name of AC circuits that increase wanted frequencies and/or decrease unwanted frequencies. These circuits are used in equalizers.	electronic <u>filter</u> circuits [or <u>filters</u>]



Question #27: Literature – Mythology

10 points per part

His wife's hair was made of literal gold.		
1	Name this Norse god of thunder who tried to fish up the Midgard Serpent. At Ragnarok, he will kill and be killed by the serpent.	<u>Thor</u>
2	Among Thor's prized possessions is Mejingjard [MEH-jeeng-yahrd] , one of these objects that doubles his already great strength.	<u>belt</u>
3	Thor's chariot is pulled by two of these animals. Able to regenerate daily, Thialfi accidentally lamed one of them by breaking a leg to suck out the marrow.	<u>goats</u>

Question #28: Literature – Mythology

10 points per part

Her husband is Bragi [BRAH-gee] , the god of poetry.		
1	Name this Norse goddess of eternal youth who was transformed into a nut after being kidnapped by Thiazi.	<u>Idun</u>
2	Idun kept the members of the Aesir young through her custodianship of this food.	<u>apples</u> [prompt on <u>fruit</u>]
3	Thiazi was able to kidnap Idun thanks to his initial capture of this Norse trickster god.	<u>Loki</u>



Question #29: Social Studies – World History

10 points

This country was promised “fifty years of progress in five” by Juscelino [joo-shay-LEE-noe] Kubitschek. Following a military coup in this country that overthrew Joao [jow] Goulart, the guerrilla organization VAR-Palmares formed to fight the junta. For much of the 19th century, this country was headed by Dom Pedro the First and Dom Pedro the Second. This nation was originally claimed by Pedro Cabral. This country allied with Argentina and Uruguay in the Triple Alliance. Name this South American country where Portuguese is the official language.

Federative Republic of Brazil

Question #30: Math – Math Concepts

10 points

Applications to this entity are explicitly denied in statements of both the well ordering principle and the axiom of choice. The axiom of infinity begins with this entity. This entity is an element in all power sets. This concept is symbolized by the second to last letter in the Norwegian and Danish alphabets. This concept is the complement of the universe in set theory. This set is the identity set with respect to unions, and this set is a subset of all sets. Name this set whose cardinality is zero because it does not contain any elements.

empty set [or null set]



Question #31: Science – Biology

10 points

Research in 2007 indicated that a type of sea slug could manufacture this compound. The two most common types of this molecule have sixty-six carbon atoms and four nitrogen atoms. Its chemical structure consists of three **pyrroles [PIR-oles]** and one **pyrroline [PIR-oe-leen]** surrounding an atom. This molecule passes an excited electron to **pheophytin [fee-oe-FIE-tin]** after absorbing a photon to begin the light-dependent reactions. Name this pigment in plants that plays an important role in photosynthesis and that looks green.

chlorophyll [accept more specific answers]

Question #32: Literature – U.S. Literature

10 points

The characters in this novel utilize seashells for listening to the radio. To communicate, the protagonist is given a “green bullet” to put in his ear. After walking off the anesthetic injected into his leg, the protagonist learns that Faber plans to escape to St. Louis. That anesthetic was injected by the Mechanical Hound into Guy Montag, who was a different kind of fireman. Name this Ray Bradbury novel titled for the condition at which paper spontaneously burns.

Fahrenheit 451



Extra Question #1: Social Studies – World History

10 points

<p>Wounded by Donald Cunnell, this person was killed in pursuit of Wilfrid May, with the credit going to Roy Brown. He rose quickly through the ranks due to connections with Oswald Boelcke [BOLE-kee], as well as learning the leader's namesake Dicta. Shot down near Amiens [ah-may], he was the leader of the Flying Circus, or Jagdgeschwader [yagd-geh-SCHWAH-dur] One. Name this German pilot with birth name Manfred von Richthofen [RIKT-hoe-fen].</p>	<p>the Red Baron [accept Manfred von Richthofen before mention, accept The Red Battleflyer, Der Rote Kampfflieger or Le Petit Rouge]</p>
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Extra Question #2: Math – Math Concepts

10 points

<p>The inner product named for this person is the same thing as the dot product. The lemma named for this person states that if a prime number divides a product, then it must divide one of the factors. The algorithm named for this person finds the greatest common divisor of two numbers, and this person is credited for proving that there is an infinite number of primes. Janos Bolyai [YAH-nose BOLE-yie] developed a geometry that does not follow this person's laws. Name this mathematician who used five postulates and five other axioms in his book <i>Elements</i>, a text which defined geometry for centuries.</p>	<p>Euclid [prompt on Euclidean]</p>
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Extra Question #3: Fine Arts – Classical/Opera

10 points

<p>This composer's <i>Liebeslieder</i> [LEE-bes-lee-der] Waltzes for voices and piano ends with a <i>Wiegenlied</i> [VEE-gen-leed]. His <i>Saint Anthony Variations</i> are based on a theme by Joseph Haydn [HIE-din]. He set texts by Goethe [GUR-tah] in his <i>Alto Rhapsody</i>, and a work composed after his mother's death compiles texts from the Luther Bible. Hans von Bulow called his first symphony in C minor "Beethoven's 10th." Name this composer of <i>A German Requiem</i>, a set of <i>Hungarian Dances</i>, and a frequently performed Lullaby.</p>	<p>Johannes <u>Brahms</u></p>
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Extra Question #4: Literature – British Literature

10 points

<p>A tribe led by Mbonga [em-BON-guh] believed this man to be an evil spirit. Taught French by Paul D'Arnot, he assumed a leadership role after killing the Mangani leader Kerchak, who had killed his marooned father. Adopted by Kala, he fell in love with Jane Porter after saving her. Name this creation of Edgar Rice Burroughs, a man raised in the jungles of Africa.</p>	<p><u>Tarzan</u> of the Apes [accept John <u>Clayton</u>, prompt on "White-Skin"]</p>
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Extra Question #5: Science – Chemistry

10 points

A compound called hex contains six atoms of this element and one atom of uranium. A compound combining this element and carbon is mass produced by DuPont to create non-stick surfaces. A class of compounds combining this element with chlorine and carbon was mass produced as **Freon [FREE-on]** and was blamed for depleting the ozone layer. This element is combined with sodium to make the active ingredient in toothpaste. Not including the Noble gases, this is the most electronegative element. Name this lightest halogen.

fluorine [do not accept “fluoride”]



Extra Question #6: Literature – World Literature

10 points per part

Upon reading the invitation her husband received from the Minister of Education, this woman threw a tantrum that led to her husband giving her 400 francs for a dress.		
1	Name this woman who, after arriving back at their home on the Rue de Martyrs, no longer possessed an object that was worth at most 500 francs.	Mathilde <u>Loisel</u>
2	Mathilde Loisel [mah-tild loi-sel] had borrowed a necklace from this friend, and spent the better part of ten years paying off the 36,000-franc price tag of the replacement.	Madame <u>Forestier</u>
3	Mathilde Loisel’s tale of woe was told in “The Necklace” by this French author.	Henri Guy de <u>Maupassant</u> [maw-pah-sahn]

Extra Question #7: Literature – World Literature

10 points per part

Following the loss of the title object to an apparition, a prominent personage reduced his use of the phrase “Do you realize who stands before you?” when dealing with inferiors.		
1	The personage uttered that phrase to Akakiy Akakievitch [ah-KAH-kee ah-KAH-kyeh-vich] after a certain item of clothing was stolen in this short story.	“The <u>Overcoat</u> ”
2	“The Overcoat” was written by this Russian author of <i>Dead Souls</i> .	Nikolay <u>Gogol</u>
3	The action of “The Overcoat” is set in this major Russian city on the shores of the Gulf of Finland.	<u>St. Petersburg</u> [do not accept “Petrograd” or “Leningrad”]



Extra Question #8: Science – Chemistry

10 points per part

Most elements in the periodic table fall into this classification, especially the ones that are lower and to the left.		
1	Name these elements that are generally solid at room temperature and are shiny with high conductivity.	<u>metals</u>
2	This is the general name for the combination of a metal element with another element, which often is another metal.	<u>alloys</u>
3	This type of alloy, such as nitinol [NIT-in-ol] , can be bent, but the bending can be undone by heating.	<u>shape memory</u> alloy [or <u>superelasticity</u> or <u>pseudoelasticity</u>]

Extra Question #9: Science – Chemistry

10 points per part

Many metal oxides have this property.		
1	Name these molecules that can act as both acids and bases.	<u>amphoteric</u> [or <u>amphoterous</u> or <u>amphoterism</u> , do not accept “amphiprotic”]
2	These substances are classified by their heads into four categories, one of which is amphoteric. Name this group of substances that are used as emulsifiers or detergents.	<u>surfactants</u> [or <u>surface-active agents</u>]
3	Surfactant molecules join together to form these colloidal structures that usually are hydrophobic in their centers.	<u>micelles</u>



Question #1: Math – Math Concepts

10 points

<p>The super types of these shapes are Lamé [lah-MAY] Curves, one type of which is both an astroid and this shape's evolute. If and only if the inner circle has half the radius of the outer circle, this shape can be generated by tracing a point inside the inner circle as it rotates around the inside of the outer circle. This shape can be generated by holding down the ends of a string with slack and stretching it as you trace. This shape has an eccentricity between zero and one and is a closed conic section. Name this shape generated by stretching a circle in one direction.</p>	<p><u>ellipse</u></p>
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Question #2: Literature – U.S. Literature

10 points

<p>The main character in this story regretted not wearing a guard like the one Bud wore. That man had the ultimate goal of being with the boys in Henderson Creek by 6 PM. The protagonist of this story told the old man of Sulphur Creek that he was right before lying down for the last time. That man chided himself for not performing the title action before trying to eat his lunch with numb fingers. Name this Jack London story about a man and a dog traveling through extreme cold.</p>	<p><u>“To Build a Fire”</u></p>
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Question #3: Miscellaneous – Sports

10 points

Ed Walsh, who holds the Major League Baseball career **ERA [ee ar ay]** record, played almost his entire career for this team. This team's run at the 1959 **AL [ay el]** Pennant featured Luis **Aparicio [a-pah-REE-show]** at shortstop and Nellie Fox at second base. Eddie **Cicotte [sie-KOH-tee]** featured prominently in this club's 1917 World Series win, but he was one of eight players banned for life for throwing the 1919 World Series. Name this 2005 World Series Champion that plays its home games at US Cellular Field and that currently features **Jose Abreu [hoe-SAY ah-BRAY-yoo]** and Chris Sale.

Chicago **White Sox** [prompt on **Chicago** or **Sox** or **Black Sox**]

Question #4: Science – Biology

10 points

These cells require the gene MECP2 to function properly, and mutations of that gene cause Rett syndrome in girls. Some of these cells, such as Betz cells, are classified as pyramidal. Some of these cells produce **GABA [GA-buh]**, including **Purkinje [pur-KIN-jee]** cells. The part of this cell containing the nucleus is called the **perikaryon [pehr-uh-KAR-ee-on]** or soma. These cells also have a long projection called an axon and several smaller ones called **dendrites [DEN-drites]**. Name these cells, many of which are found in your brain.

neuron [or **nerve cell**]



Question #5: Literature – British Literature

10 points

<p>A locket that belonged to the protagonist of this novel was destroyed by Edward “Monks” Leeford, who attempted to rob that character of his inheritance. The title character is introduced as though he is from Greenland by a character whose real name is Jack Dawkins. After Rose learns of a scheme in this novel, Nancy is murdered by Bill Sikes [sikes]. That scheme was hatched by the career criminal Fagin [FAY-gin], who ran a gang of pickpockets. Name this Charles Dickens novel concerning the travails of the title workhouse orphan.</p>	<p><i>Oliver Twist: The Parish Boy's Progress</i></p>
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Question #6: Social Studies – World History

10 points

<p>Nikita Khrushchev suggested replacing this post with a committee of three persons of different alignments. One person who held this position later became the President of Austria and was then found to have lied about his past to hide connections with the Nazis. Another holder of this post died en route to negotiate a cease-fire involving Katanga. Trygve Lie [TRIG-vee lee] was the first elected holder of this post, also held by Kurt Waldheim [VAHLD-hime], Dag Hammar-skjold [HAHM-ur-skyoeld], and Kofi Annan. Name this post whose current holder is Ban Ki-Moon.</p>	<p><u>Secretary-General</u> of the United Nations [prompt on answers implying leadership of the United Nations or UN]</p>
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Question #7: Science – Physics

10 points per part

Identify these properties of waves.		
1	Name the property that can be classified as constructive or destructive and can be explained by superposition. This effect can create patterns that are sometimes hyperbolic.	<u>interference</u>
2	Waves are able to undergo this bending that allows them to spread out after going through a small hole.	<u>diffraction</u> [accept word forms]
3	This principle states that each point on a wave can be considered the source of a spherical wave. This principle is often named for the first scientist to devise it, though Fresnel's [freh-nel's] name is sometimes added because of his extensions of it.	<u>Huygens</u> [HOY-gens] principle

Question #8: Science – Physics

10 points per part

Name these laws and theories from electromagnetism.		
1	This inverse square law gives the magnitude of an electrostatic force.	<u>Coulomb</u> 's law
2	Two laws, the junction law and the circuit law, that simplify calculations in complicated circuits, are named for this scientist.	Gustav <u>Kirchhoff</u> 's laws
3	This theory, which is named using the first letters of the last names of the scientists who developed it, explains conventional superconductors.	<u>BCS</u> theory [or <u>Bardeen Cooper Schrieffer</u>]



Question #9: Social Studies – Geography

10 points per part

This river forms part of the eastern border of Oregon.		
1	Name this tributary of the Columbia, which saw its valley flooded when the Teton Dam collapsed.	<u>Snake</u> River
2	The Snake River was traversed by the Corps of Discovery, led by these two explorers. They used it to reach the Columbia, followed by Fort Clatsop.	Meriweather <u>Lewis</u> and William <u>Clark</u>
3	The Snake River forms Twin Falls in this state a few miles away from the city of Twin Falls.	<u>Idaho</u>

Question #10: Social Studies – Geography

10 points per part

Ferdinand de Lesseps headed the company that tried unsuccessfully to build this structure.		
1	Name this waterway that was under United States control prior to its transfer to its namesake Central American country, which was negotiated under President Jimmy Carter.	<u>Panama Canal</u>
2	The United States initially negotiated the Hay-Herrán treaty with this country to obtain the land rights needed to build the canal, before fomenting a revolution within Panama.	Republic of <u>Colombia</u>
3	Prior to the construction of the Panama Canal, ships that wished to navigate past the Americas usually sailed through this cape, just south of the Tierra del Fuego islands.	Cape <u>Horn</u>



Question #11: Literature – World Literature

10 points per part

The speaker of this poem described plunging his “gentle and turbulent hand” into loose dirt as a “sword sheathed in meteors.”		
1	Name this poem whose last section includes the narrator describing a deceased man as “water-bearer of Andean tears.”	“The <u>Heights of Macchu Picchu</u> ” [prompt on <u>Canto General</u>]
2	“The Heights of Macchu Picchu” was part of this poet’s <i>Canto General</i> .	Pablo <u>Neruda</u> [accept Neftali Ricardo <u>Reyes</u> y Basoalto]
3	Along with Gabriela Mistral, Pablo Neruda was born in this South American country. Isabel <u>Allende</u> [ah-YEN-day] was born in Peru but moved to this country as a small girl.	Republic of <u>Chile</u>

Question #12: Literature – World Literature

10 points per part

This poet’s eponymous meter consists of four-line stanzas.		
1	Name this poet described as the “tenth muse” by Plato. Catullus’ <u>epithalamium</u> [eh-pih-thah-LAY-mee-um] was inspired by one written by this native of Lesbos.	<u>Sappho</u>
2	An epithalamium is a poem dedicated to the primary participants in this event. The narrator of Samuel Coleridge’s “Rime of the Ancient Mariner” is identified as a guest at such an event.	<u>wedding</u> [accept equivalents]
3	In a “Hymn to” this goddess, Sappho called this child of Zeus “iridescent-throned.” The speaker claimed to have seen this goddess “with a sudden brilliance.”	<u>Aphrodite</u> [do not accept “Venus”]



Question #13: Math – Probability

10 points per part

This operation on sample spaces is sometimes represented by the word ‘and’.		
1	Name this operation on two sample spaces, or sets, that gives the results that are in both sample spaces as opposed to just one or the other.	<u>intersection</u>
2	If the probability of Event X is 0.6, and the probability of the Event, quantity, X intersection Y, is 0.4, then what is the probability of the Event, quantity, X intersection not Y?	<u>0.2</u> [or <u>one-fifth</u>]
3	If the probability of Event X is 0.5, the probability of Event Y is 0.6, and the probability of the Event, quantity, X intersection Y, is 0.3, then what is the probability of the Event, quantity, X union Y?	<u>0.8</u> [or <u>four-fifths</u>]

Question #14: Math – Probability

10 points per part

These diagrams are used to organize probability problems that involve more than one event.		
1	Name these diagrams that share their name with a connected graph without cycles.	<u>tree</u> diagram
2	If three coins are tossed in order, what is the probability that the first coin is heads, the second coin is tails, and the third coin is tails?	<u>1/8</u> [or <u>0.125</u>]
3	If three coins are tossed, what is the probability that exactly one is heads?	<u>3/8</u> [or <u>0.375</u>]



Question #15: Science – Astronomy

10 points

<p>When the center of one of these objects gives off a lot of ultraviolet radiation, it is classified as the Markarian [mahr-KAHR-ee-un] type, and some of those objects are classified as the Seyfert [SAY-furt] type. One theory of these objects states that younger ones often contain quasars. One collection of these objects is the Virgo Cluster, while the collection of these objects that we belong to is the Local Group. The primary classifications of these objects are irregular, elliptical, and spiral. Name these collections of stars and other objects such as our Milky Way.</p>	<p><u>galaxy</u> [or <u>galaxies</u>]</p>
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Question #16: Fine Arts – Classical/Opera

10 points

<p>In one of this composer's operas, based on a David Belasco play, a woman sings that she will see a ship enter the harbor near her home carrying her husband in the aria "Un Bel Di Vedremo [vay-DRAY-moe]." This composer included the aria "O Mio Babbino Caro" in Gianni Schicchi [jah-nee skee-kee]. "Che Gelida Manina" is sung to the consumptive Mimi, the lover of Rodolfo in one of his operas. In one of his works, Pinkerton abandons his Japanese wife Cio-Cio [choe choe] San. Name the composer of <i>La Bohème [boe-hem]</i> and <i>Madame Butterfly</i>.</p>	<p>Giacomo Antonio Domenico Michele Secondo Maria <u>Puccini</u></p>
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Question #17: Social Studies – U.S. History

10 points

Applicants for jobs with this group had to be “skinny, wiry, and not over 18.” Founded by William Russell and Alexander Majors, it created a special mochila [moe-CHEE-lah] for employees to use. This organization folded in 1861 following the completion of the Pacific Telegraph Line. Buffalo Bill Cody claimed to work for this company, and his stories are credited for making it legendary. Stretching from St. Joseph, Missouri to Sacramento, name this defunct 19th century cross-country mail service that utilized horses.

Pony Express

Question #18: Literature – World Literature

10 points

This author wrote a story in which the narrator wondered if “in the cellar, where he saw all things,” he saw the title object. He also wrote of an area which had the Pavilion of Limpid Solitude at its center; that area was created by Tsui Pen. This author of “The Aleph” and “The Garden of Forking Paths” also wrote about an enormous collection of books that each have 410 pages. Name this Argentine author of “The Library of Babel” whose works are collected in *Ficciones* [fik-see-OE-nees].

Jorge Luis Borges



Question #19: Science – Chemistry

10 points

<p>This person worked with Emile Zuckerlandl [zoo-ker-KAHN-del] on hemoglobin studies that determined the rate of evolution, creating a molecular clock. His book titled <i>The Nature of the Chemical Bond</i> introduced the concept of hybridization. After this person with others worked out the structure of proteins, he proposed a triple helix structure for DNA. This person also introduced the concept of electronegativity, and one of its scales is named for him. Name this scientist who won Nobel Prizes in Chemistry and Peace.</p>	<p>Linus Pauling</p>
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Question #20: Social Studies – Economics

10 points

<p>By the Dodd-Frank Act, this organization utilizes stress testing to examine members' reactions to adverse economic conditions. Most of its member institutions are required to keep a reserve of at least three percent of total liabilities. Through its Open Market Committee, it directly influences domestic monetary policy. The goals of this organization include maximum employment, stable prices, and moderate long-term interest rates. Currently led by Janet Yellen, name this system that oversees the nation's financial institutions.</p>	<p>Federal Reserve System</p>
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Question #21: Fine Arts – Art History

10 points per part

This artist painted herself crying, her body full of nails, being held together by straps while down her center runs a broken Greek column representing her spine after a bus accident.		
1	Name this artist of <i>The Shattered Column</i> and many other self-portraits that prominently include her unibrow.	Frida <u>Kahlo</u>
2	Frida [FREE-dah] Kahlo and her husband, the muralist Diego Rivera, were natives of this country.	<u>Mexico</u> [or United <u>Mexican</u> States]
3	In the self-portrait <i>The Two Fridas</i> , Kahlo shows two versions of herself, with this internal organ visible in both.	<u>heart</u>

Question #22: Fine Arts – Art History

10 points per part

This man painted a portrait of Anne of Cleves [kleevs] that was instrumental in convincing his employer to marry her.		
1	Name this German-born court painter who created portraits of Sir Thomas More and Erasmus.	Hans <u>Holbein</u> the Younger
2	Hans Holbein created many portraits of this English king, in whose court he served. Holbein was earlier employed by his wife Anne Boleyn.	<u>Henry VIII</u>
3	This Holbein painting shows Jean de Dinteville [jon de dint-vil] and Georges de Selve [jorj de selv] standing in front of a shelf holding a lute, a globe, and an astrolabe.	<i>The French</i> <u>Ambassadors</u>



Question #23: Literature – U.S. Literature

10 points per part

Sondra Finchley takes an interest in the protagonist of this novel out of spite.		
1	Name this novel in which Clyde Griffiths engineers the death of the pregnant Roberta Alden.	<i>An <u>American Tragedy</u></i>
2	This author of <i>An American Tragedy</i> wrote about the social climb of a girl from rural Wisconsin in <i>Sister Carrie</i> .	Theodore <u>Dreiser</u>
3	The plot of <i>An American Tragedy</i> drew on the murder by Chester Gillette of Grace Brown in this state, the setting for much of the action of Book Two of the novel.	<u>New York</u>

Question #24: Literature – U.S. Literature

10 points per part

Hartman's Cafe in Holcomb, Kansas is a hotbed of gossip surrounding a gruesome murder in this book.		
1	Name this book in which one rumor implicated Taylor Jones in the murder of the Clutter family.	<i><u>In Cold Blood</u></i>
2	<i>In Cold Blood</i> was penned by this author. He wrote of the escapades of Holly Golightly in <i>Breakfast at Tiffany's</i> .	Truman <u>Capote</u>
3	Dick Hickock and Perry Smith fled to this western city, where they were arrested thanks to a tip from Floyd Wells. Hunter S Thompson wrote an autobiographical novel about two trips to this city.	<u>Las Vegas</u> , Nevada



Question #25: Science – Chemistry

10 points per part

This type of bonding is common when nonmetallic elements are bonded to each other.		
1	Name this type of bonding that involves sharing electron pairs.	<u>covalent</u> bond
2	Covalent bonds are often shown using diagrams with dots named for this American scientist.	Gilbert Newton <u>Lewis</u>
3	If four lobes of one orbital overlap four lobes of another orbital, then the result is this type of covalent bond. Your answer should be a Greek letter.	<u>delta</u> bond

Question #26: Science – Chemistry

10 points per part

In the constitutional type of this phenomenon, there can be different groups within a molecule, but that is not the case with the stereo type.		
1	Name this phenomenon in which two molecules have the same chemical formula but different structures.	<u>isomers</u> [or <u>isomerism</u>]
2	This property refers to stereoisomers that are mirror images of each other. The molecules can be called enantiomers [ee-NAN-tee-oe-murs] or optical isomers.	<u>chirality</u>
3	A two-dimensional diagram used to see the differences between enantiomers is named for this scientist who studied sugars and purines. Along with Alex Speier, this person developed a type of esterification using a carboxylic [kahr-bok-SIL-ik] acid.	Hermann Emil Louis <u>Fischer</u>



Question #27: Social Studies – U.S. History

10 points per part

This Representative cast the sole vote against the United States entering World War II.		
1	Name this Montana Congresswoman who was also the first female elected to serve in the House.	Jeannette Pickering <u>Rankin</u>
2	During her successful re-election bid in 1940, Rankin received a strong endorsement from this Wisconsin progressive who ran for President in 1924, only carrying his home state.	Robert “Fighting Bob” <u>La Follette</u> [FOLL-et]
3	Rankin was also endorsed by this former New York Congressman and Depression-era mayor of New York City. One of New York’s airports is named for this man.	Fiorello <u>LaGuardia</u>

Question #28: Social Studies – U.S. History

10 points per part

His acceptance of a bribe from a soft drink giant led to his derisive nickname of “Pepsi-Cola Kid.”		
1	Name this Wisconsin senator whose oratory and mudslinging instigated the 1950s Red Scare.	Joseph <u>McCarthy</u>
2	Roy Cohn, whom Joseph McCarthy tapped as his chief of staff, was the prosecutor in the trial of this couple that was convicted of spying and sentenced to death.	Ethel and Julius <u>Rosenbergs</u>
3	While McCarthy’s attacks against Communists are known as the Red Scare, his attacks against homosexuals are named for this color thanks to a quote by Senator Everett Dirksen and a book by David Johnson.	<u>Lavender</u> Scare



Question #29: Math – Math Concepts

10 points

<p>Every non-empty set of this infinite set that is bounded below has an infimum [in-FIH-mum] that is also in this set, meaning that the greatest number less than or equal to numbers in the subset is in this set. This is the set of all numbers converged to by a Cauchy [kow-shee] sequence of rational numbers. Cantor’s diagonalization argument demonstrated that the irrationals and this set are both uncountable. This set includes the scalars that can be multiplied by vectors, and it consists of all numbers that can be located on a standard number line. Identify this set known as the continuum [kun-TIN-yoo-um] which consists of the union of rational and irrational numbers.</p>	<p>real numbers [or reals, accept continuum before it is mentioned]</p>
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Question #30: Social Studies – World History

10 points

<p>This person was born in Nice [neese] and years later wished to attack France to take control of the city. As the head of the Alpine Huntsmen, this person oversaw victories at Como and Varese [vah-RAY-say]. Against Juan Manuel de Rosas, this person led the Uruguayan navy. His forces overthrew the Neapolitan Francis the Second, conquering the Kingdom of the Two Sicilies during a turning point for the Risorgimento [ree-sor-jee-MEN-toe]. Name this military leader of the Redshirts and pivotal figure in the unification of Italy.</p>	<p>Giuseppe Garibaldi</p>
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Question #31: Literature – British Literature

10 points

<p>One character in this novel dreams of a song that spoke of a “golden future time.” In this novel, “brain work” is used to excuse the rationing of milk and apples. Following the Rebellion, the offspring of Jessie and Bluebell are used to chase Snowball away, solidifying power in the hands of Napoelon. Name this novel about anthropomorphic animals who take over the title location, written by George Orwell.</p>	<p><u><i>Animal Farm</i></u></p>
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Question #32: Science – Physics

10 points

<p>An equation named for this person multiplies mobility times Boltzmann’s constant times temperature to find a diffusion constant. The combined impact of three galaxies have formed a ring named for this person, which is explained by gravitational lensing. In his paper “On the Electrodynamics of Moving Bodies”, this scientist solved the “moving magnet and conductor problem” and created a theory consistent with the Michelson-Morley experiment’s inability to detect the luminiferous ether. Name this scientist who explained Brownian motion and created relativity theory.</p>	<p>Albert <u>Einstein</u></p>
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Extra Question #1: Literature – U.S. Literature

10 points

This location served as the inspiration for a planned epic by Jonathan Swift Somers. A former resident of this town babbled about the old horse races at Clary's Grove. Elmer, Herman, Ella, and Kate all used to live here, but are now "sleeping on the hill." Name this fictional location whose residents' epitaphs were published in an "anthology" by Edgar Lee Masters.

Spoon River [accept **Spoon River**
Anthology]

Extra Question #2: Math – Math Concepts

10 points

With linear transformations, this concept is equivalent to the column space of a matrix, and its dimension equals the rank of the matrix. The entirety of this set is used for a surjective function. For the sine and cosine functions, this set includes all of the numbers from negative one to one, inclusive, and for constant functions this set contains only a single value. In statistics, this number equals the difference between the largest and smallest number in a distribution. Name this set that gives the outputs of a function, often contrasted with the domain.

range [or **image** or **codomain**, do not accept "domain"]



Extra Question #3: Fine Arts – Art History

10 points

This man created a sculpture of a man's torso and legs that is named *The Walking Man*. He sculpted an obese nude author, while another sculpture of the same author shows him scowling and wrapped in a cloak. This sculptor of multiple monuments to Balzac showed Paolo and Francesca [frahN-CHES-kah] da Rimini embracing in one work, which also depicts Dante [DAHNT-ay] sitting. Name this sculptor of *The Gates of Hell*, which inspired his works *The Kiss* and *The Thinker*.

Auguste Rodin

Extra Question #4: Science – Physics

10 points

A balance named for this unit uses current and potential difference to measure mass. The measurement device named for this unit contains a potential coil and a pair of current coils. This unit equals a volt squared per ohm, and this unit also equals a volt ampere. This unit is named for the person who improved the Newcomen steam engine and who developed a unit that measures the same type of quantity, the horsepower. Name this unit equivalent to a kilogram meter squared per second cubed and also equivalent to a Joule per second, the SI unit of power.

Watt



Extra Question #5: Social Studies – U.S. History

10 points

<p>Samuel Mathews failed in his attempt to dissolve this organization, while John Murray was successful in doing so, though it still met prior to the First Continental Congress. Its “Long Assembly” began following the ascension of Charles II of England. With the Governor’s Council, this body made up part of its polity’s General Assembly. Name this legislative body of colonial Virginia.</p>	<p>House of <u>Burgesses</u></p>
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Extra Question #6: Literature – U.S. Literature

10 points per part

In this novel, the youngest son of the central family, Dude, marries a preacher twenty-three years his senior.		
1	Name this novel centering on the travails of the Lester family. Dude runs over grandma with Bessie’s car before taking off, and Jeeter and Ada end up dying when their house burns down.	<u><i>Tobacco Road</i></u>
2	<i>Tobacco Road</i> was written by this author of <i>God’s Little Acre</i> .	Erskine Preston <u>Caldwell</u>
3	The action of <i>Tobacco Road</i> is set in this state. In another story set in this state, the main family debates between traveling to either Tennessee or Florida, but the Misfit and his cohorts shoot them.	<u>Georgia</u>

Extra Question #7: Literature – U.S. Literature

10 points per part

The manuscript of her story was given to John Ray by the lawyer of a “white widowed male.”		
1	Name this nymphet who ran off with Clare Quilty. She eventually married the partially-deaf Dick Schiller, but died giving birth to their first child.	<u>Dolores</u> Haze [accept <u>Lolita</u> or <u>Dolly</u>]
2	This author of the 999-line work <i>Pale Fire</i> wrote <i>Lolita</i> .	Vladimir <u>Nabokov</u>
3	Before Lolita’s death, Dick planned to take her with him to this US State. Jon Krakauer’s <i>Into the Wild</i> chronicled the journey of Christopher McCandless’ solo journey to the wilderness of this state.	<u>Alaska</u>



Extra Question #8: Math – Geometry

10 points per part

Consider a right triangle with side lengths of five, twelve, and thirteen.		
1	One of the acute angle measures is approximately 22.6 degrees. Rounded to the nearest tenth of a degree, what is the measure of the other acute angle?	<u>67.4</u> degrees [or <u>67 4/10</u> or <u>67 2/5</u>]
2	What is the name for the segment drawn from one vertex of a triangle that is perpendicular to the opposite side of the triangle?	<u>altitude</u>
3	What is the length of the altitude to the hypotenuse in a five twelve thirteen right triangle? You can express your answer as a mixed fraction or improper fraction.	<u>60/13</u> [or <u>4 8/13</u>]

Extra Question #9: Mathematics – Geometry

10 points per part

Answer the following questions about parallelograms.		
1	What type of linear transformation changes a rectangle into a parallelogram?	<u>skew</u>
2	The area of Parallelogram ABCD is 10. What is the area of Triangle ABC?	<u>5</u>
3	In Parallelogram WXYZ, the length of Segment WX is ten, the length of Segment XY is twenty, and the area of the parallelogram is one hundred. Find the measure of either of the obtuse interior angles in the parallelogram in degrees.	<u>150</u> degrees



Question #1: Social Studies – Religion

10 points

According to Hebrews Book 9 Verse 4, one of this person's possessions was stored in the Ark of the Covenant with the fruit it bore. During a battle against the **Amalekites** [uh-MAL-ih-kites], this man held up one of his brother's hands. One story of his death involved him being stripped of his priestly garments on Mount Hor, and them being handed to his son **Eleazar** [el-ee-AY-zahr]. This person was a spokesman for his brother. This person bent to the will of the people in constructing a golden calf while his brother was receiving the Ten Commandments on Mt. Sinai. Name this brother of Moses.

Aaron

Question #2: Science – Chemistry

10 points

Though this compound does not contain sodium, it can be produced by combining sodium **acetate** [A-suh-tate] with soda lime. This compound combines with chlorine gas to yield chloroform and hydrogen chloride. **Clathrates** [KLA-thrates] trapping this compound in ice exist in permafrost regions on Earth. Though usually a gas on Earth, this compound is the main component of the lakes on Titan. A majority of firedamp, marsh gas, and natural gas consist of this compound. Name this simplest hydrocarbon, made of one atom of carbon and four atoms of hydrogen.

methane [prompt on CH₄]



Question #3: Language Arts – Grammar/Usage

10 points

<p>The pathetic fallacy is a form of this literary device commonly used in poetry. An apostrophe employs this device in drawing attention to the intended target. Utilized in the Book of Proverbs with both wisdom and folly, Mammon is an example of this device in the New Testament involving money. This device is sometimes applied to death, such as when John Donne tells death not to be proud or when artists depict the Grim Reaper. Name this literary device in which human traits are assigned to non-human things.</p>	<p><u>personification</u> [accept <u>anthropomorphism</u>]</p>
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Question #4: Social Studies – U.S. History

10 points

<p>The decision in <i>Harris v New York</i> established that this case's precedent could not be used to permit perjury. The majority opinion in this case was re-affirmed in <i>Dickerson v US</i>, which concerned a voluntary statement. This case utilized the precedent set in <i>Escobedo</i> regarding a person's right to counsel. Utilizing defendants' rights to counsel and against self-incrimination, name this case that established the precedent that persons arrested must be read their rights.</p>	<p><u>Miranda</u> v Arizona [prompt on <u>Arizona</u>]</p>
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Question #5: Miscellaneous – Technology

10 points

The “almanac” signal provided by this system is utilized by cellular service providers to gather and transmit data gathered by it. China’s **Beidou** [bay-dow] and the European Union’s Galileo are operational parallels of this system. The “differential” systems developed for this system have improved its accuracy to around ten centimeters. This system uses at least 24 satellites, which send out signals that are detected in many cars and mobile phones. Name this system used to provide navigation and timing information in addition to location data.

Global Positioning System
[accept **GPS**]

Question #6: Science – Health

10 points

This drug has a chemical structure similar to uric acid, but this has three **methyl** [METH-ul] groups and only two oxygen atoms, giving it a formula of **C₈H₁₀N₄O₂** [see eight aich ten en four oe two]. The FDA put out a warning after the 2014 death of Logan Stiner from the powdered form of this drug. This drug can be removed from materials by the Swiss Water process, **ethyl acetate** [ETH-ul A-suh-tate], or supercritical carbon dioxide. This drug is a type of **xanthine** [ZAN-theen] commonly blamed for insomnia and withdrawal headaches. Name this stimulant found in chocolate, cola, and coffee.

caffeine



Question #7: Math – Algebra

10 points per part

These functions are defined differently over different parts of their domains.		
1	Name these functions that include a model for the force of gravity, which grows linearly with distance from center inside the earth but decreases outside the earth.	<u>piecewise</u> -defined functions [or <u>hybrid</u> functions]
2	If a piecewise function is defined so that y equals x plus k when x is less than four, but y equals two x plus two k when x is greater than or equal to four, find the value of k so that the function is continuous at x equals four.	<u>-4</u>
3	If there is more than one trend, piecewise functions are used in this process of estimating values of a function between known values. This process can involve curve fitting and least-squares regressions and is only used between known values.	<u>interpolation</u> [accept word forms]

Question #8: Math – Algebra

10 points per part

Some sources claim that this set is equivalent to the natural or counting numbers, while other sources claim that this set contains zero, and those other sets do not.		
1	Name this set of numbers generally considered equivalent to the non-negative integers.	<u>whole</u> numbers
2	This property of a set and an operation states that applying the operation to two elements in a set returns an element in that set. The whole numbers have this property under addition and multiplication but not under subtraction and division.	<u>closure</u> [or <u>closed</u>]
3	How many whole numbers are there that the whole number eighty-one can be divided by so that the result is a whole number?	<u>5</u>



Question #9: Social Studies – World History

10 points per part

This former commander of his country’s air force utilized “positive neutrality” in dealing with foreign governments.		
1	Name this African president who initially announced that he was handing the reins of power over to Omar Suleiman [SOO-lee-mahn] but was overthrown and succeeded by Mohamed Morsi [MOR-see] of the Muslim Brotherhood.	Mohammad Hosni <u>Mubarak</u>
2	Hosni Mubarak rose to power in this nation following the assassination of Anwar Sadat [sah-DAHT] .	Arab Republic of <u>Egypt</u>
3	Sadat’s assassination came during a celebration of the Yom Kippur War, during which Egypt invaded the Sinai Peninsula, while this other nation tried to take the Golan Heights.	<u>Syria</u> [accept <u>Syrian Arab Republic</u>]

Question #10: Social Studies – World History

10 points per part

His efforts at mediating the conflict in Bengal led to his assassination by Nathuram Godse [GOD-say] .		
1	Name this person who, with Jan [yahn] Smuts , negotiated for better treatment of Indians in South Africa. In protesting the treatment of Untouchables, he renamed the caste “ Harijans [HAHR-ee-juns] ,” or “children of God.”	<u>Mohandas Karamchand</u> “Mahatma” <u>Gandhi</u> [prompt on “Gandhi”]
2	Gandhi drew the attention of the British when he organized a march across India to protest legislation that heavily taxed this mineral and diet staple. The march ended at the Arabian Sea at Dandi [DAH-nee] .	<u>salt</u> [accept <u>Salt March</u>]
3	The Salt March was the first prominent display of this philosophy, a combination of civil disobedience and non-cooperation. The name of this philosophy is the combination of two Sanskrit words.	<u>satyagraha</u> [sah-tyah-GRAH-hah]



Question #11: Science – Chemistry

10 points per part

Most of the rare earth elements are in this set of elements.		
1	Name these elements that are above the actinides [AK-tuh-nides] on the periodic table.	lanthanides [or lanthanoids]
2	Lanthanides [LAN-thuh-nides] and actinides generally have partially filled orbitals represented by this letter. These orbitals can hold 14 electrons, which is why there are 14 lanthanides and 14 actinides.	f
3	Lanthanides are often found in this mineral that also contains phosphate. This mineral's name comes from the Greek word for alone.	monazite

Question #12: Science – Chemistry

10 points per part

This organization has at times disagreed with the Joint Institute for Nuclear Research in Dubna, though it honored that institute with the name of element 105.		
1	Name this organization that standardizes chemical nomenclature.	IUPAC [or International Union of Pure and Applied Chemistry]
2	IUPAC [eye-yoo-pak] established this set of conditions as 100 kilopascals and zero degrees Celsius.	STP (or standard conditions for temperature and pressure or standard conditions for pressure and temperature)
3	One of this unit is equal to the pressure at STP. This pressure unit is close to an atmosphere in size.	bar



Question #13: Fine Arts – Jazz

10 points per part

Stan Getz played this instrument on bossa nova recordings, including “The Girl From Ipanema [ih-pah-NEE-mah].”		
1	Name this reed instrument that is most commonly played in its alto and tenor versions. Jazz performers of this instrument include Wayne Shorter and Kenny G.	<u>saxophone</u>
2	This saxophonist stopped performing his instrument at the end of his track “Acknowledgement” to repeatedly sing the phrase “A Love Supreme.” His band also released the album <i>Giant Steps</i> .	John William <u>Coltrane</u>
3	This Kansas Citian [SIH-teen-un] performed saxophone on the bebop songs “Ko-Ko” and “Yardbird Suite,” which is titled after his nickname.	Charlie “Bird” <u>Parker</u>

Question #14: Fine Arts – Jazz

10 points per part

This man changed the lyrics of “Baby Its Cold Outside” to promote Swiss Kriss, and his early bands included the Hot Five and Hot Seven.		
1	Name this performer, nicknamed Satchmo, whose later hits include “What a Wonderful World” and “Mack the Knife.”	Louis <u>Armstrong</u>
2	Armstrong performed on this instrument and a similar instrument called the cornet [KOR-net]. Dizzy Gillespie played one of these instruments with an upturned bell, and his cheeks would puff out when he played.	<u>trumpet</u>
3	Armstrong was a pioneering musician from this city, where early jazz was developed in its brothel-filled neighborhood Storyville.	<u>New Orleans</u> , Louisiana



Question #15: Science – Physics

10 points

<p>Depending on which type of this phenomenon occurs, neutrino [nue-TREE-noe] scattering can be elastic or inelastic. Because only left-handed fermions [FER-mee-ons] are impacted by this phenomenon, this phenomenon violates parity. This phenomenon is responsible for beta decay, which allow quarks to change flavors. The neutral current type of this phenomenon involves the Z boson, and the other type involves the W bosons. This interaction has been unified with electromagnetism. Name this interaction classified as one of the four fundamental forces.</p>	<p>weak nuclear interaction [or weak nuclear force, prompt on electroweak]</p>
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Question #16: Literature – U.S. Literature

10 points

<p>This writer borrowed from Book Six of the <i>Metamorphoses</i> for a poem about a painting by Richard Wilson. In another poem, this writer cites mercy as that which taught her soul to understand that there's a God and a Savior. Many of this writer's works were collected in <i>Poems on Various Subjects, Religious and Moral</i>. She wrote of a man deserving of "a crown, a mansion, and a throne that shine" in "To His Excellency General Washington." Name this writer of "On Being Brought from Africa to America" who was a Revolution-era African American female poet.</p>	<p>Phillis Wheatley</p>
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Question #17: Math – Math Concepts

10 points

When these operations are used on spaces that have been transformed, a correction called a **Jacobian** [yah-KOBE-ee-un] is used. When the line type of this operation is used to calculate work in a conservative field, it is path independent. The fact that the order in which this operation is performed does not matter is **Fubini's** [foo-BEE-nee's] theorem. This operation can sometimes be simplified by first breaking a function down into partial fractions, and methods for performing this operation include performing it by parts. Name this operation whose indefinite type is equivalent to taking an antiderivative.

integral [accept word forms such as **integration** and more specific answers, prompt on **antiderivative**, do not accept “derivative”]

Question #18: Social Studies – U.S. Government

10 points

In *McCulloch v. Maryland*, Chief Justice Marshall cited the embarrassment of the Articles of Confederation in explaining that “expressly” was not included in this amendment. The case of *Collector v. Day* utilized this amendment in deeming a certain tax unconstitutional, while *Hammer v. Dagenhart* ruled that the Keating-Owen Act’s regulations on interstate commerce violated this amendment. Name this amendment that defers powers to the states if they are not delegated to the federal government, the last amendment in the Bill of Rights.

Tenth Amendment to the United States Constitution



Question #19: Literature – Mythology

10 points

The **Meliae** [MEH-lee-ay], a group of ash tree nymphs, were born from the blood of this god, as were the Furies and Giants. The father of the **Hecatonchires** [heh-kah-TON-kires] and **Cyclopes** [SIE-klops], **Aphrodite** [A-froe-die-tee] was born from the sea foam that resulted when this god was castrated by his son Cronus. The father of the Titans via **Gaea** [GIE-uh], name this Greek primordial god of the sky.

Uranus [accept Coelus]

Question #20: Fine Arts – Art History

10 points

It appears that a cane is being used to support the title object in this artist's *Apparatus and Hand*, which is in a museum dedicated to him in Saint Petersburg, Florida. This artist painted a tiger leaping out of the mouth of another tiger, which is leaping out of the mouth of a fish, lunging towards a naked woman with a bayonet pointed at her. He painted the Venus de Milo 28 times in a painting dedicated to his wife Gala. This artist of *Dream Caused by the Flight of a Bee Around a Pomegranate a Second Before Awakening* and *The Hallucinogenic Toreador* painted a cheese block with a clock on top of it, both of which are melting. Name this artist of *The Persistence of Memory*.

Salvador Dali



Question #21: Social Studies – Economics

10 points per part

Information about business cycles can be deduced by looking at consumer purchases of these goods, such as appliances and cars.		
1	Name these goods that can be rented, but when purchased are expected to last for more than a calendar year.	<u> durable </u> goods
2	Because durable goods are not meant to be replaced every year, a short-term price spike will result in a drop in this aggregate quantity, as more people will wait to replace their cars.	<u> demand </u>
3	Because of the flexibility in choosing when to replace a durable good, this quantity with regards to demand is higher. It is calculated by dividing the percentage change in quantity by the percentage change in price for a particular good.	price <u> elasticity </u> of demand

Question #22: Social Studies – Economics

10 points per part

M1, M2, and M3 money are delineated based on this characteristic.		
1	Name this characteristic that can be described as the ease with which money can be converted into a different medium of exchange.	<u> liquidity </u>
2	The overall liquidity of a given money supply has a direct impact on the equation of exchange, which takes into account this characteristic, the number of times an item of currency is used during a time frame.	<u> velocity </u> of money
3	According to the quantity theory of money, if, all else being equal, the quantity of goods in a given economy is doubled, the impact on the price level will be this factor.	<u> one-half </u> [accept equivalents, do not accept forms of “doubling”]



Question #23: Science – Biology

10 points per part

This type of RNA has start and stop codons.		
1	Name this type of RNA that gets information from DNA in the nucleus and takes it to the ribosome.	<u>mRNA</u> [or <u>messenger</u> RNA]
2	This is the process in which a message from DNA is coded onto messenger RNA while the messenger RNA is created.	<u>transcription</u> [accept word forms]
3	During transcription, these particles made from small nuclear RNA remove introns so that the introns do not end up in the mRNA.	<u>spliceosomes</u>

Question #24: Science – Biology

10 points per part

This principle is named for the English mathematician and the German obstetrician who developed it independently.		
1	Name this principle of genetic equilibrium under a given set of assumptions.	<u>Hardy-Weinberg</u> Principle [accept other addition words]
2	This phenomenon is the change in a gene pool due to random chance. This phenomenon usually plays a very minor role in large populations.	genetic <u>drift</u> [or allelic <u>drift</u>]
3	Genetic drift can have more of an impact after one of these events in which a population decreases for natural or artificial reasons. The founder effect is one example of this type of event.	population <u>bottleneck</u>



Question #25: Literature – U.S. Literature

10 points per part

This resident of Cross Corners grew more unlucky the more children he had.		
1	Name this man who vowed to sell his soul for two cents after striking a rock with his plow.	<u>Jabez Stone</u> [accept either part]
2	In front of a jury featuring Blackbeard, King Phillip, and Simon Girty, this legendary orator defended Jabez Stone against the Devil in a story by Stephen Vincent Benet [bih-NAY]. In real life, this person was a senator and secretary of state.	Daniel <u>Webster</u>
3	After losing to Daniel Webster, the Devil indicated that after his last speech, Webster would be compared to this fictional New York resident scared off by the Headless Horseman.	<u>Ichabod Crane</u> [accept either]

Question #26: Literature – U.S. Literature

10 points per part

This oration begins with a quote from Deuteronomy 32:35; “Their foot shall slide in due time.”		
1	Name this speech in which the title group is compared to the unbelieving Israelites, as they are allegedly kept from a most cruel fate by a supreme being.	<u>“Sinners in the Hands of an Angry God”</u>
2	This New England Puritan orator of “Sinners in the Hands of an Angry God” also spoke on a “conjunction of diverse excellencies” in “The Excellency of Christ.”	Jonathan <u>Edwards</u>
3	In the last line, Edwards exhorted his listeners to “let everyone fly out of” this Biblical city. Two angels lodged with Abraham’s nephew in this city.	<u>Sodom</u> [prompt on <u>Sodom and Gomorrah</u>]



Question #27: Math – Analytical Geometry

10 points per part

Each point on this line is equidistant from the endpoints of a segment.		
1	Give this two word phrase that describes the relationship of the line to the segment.	<u>perpendicular bisector</u>
2	If a segment has endpoints at (2,3) and (6,11), what is the slope of its perpendicular bisector? Give a numerical answer.	<u>-1/2</u> [or <u>-0.5</u> , do not accept “1/2” or “.5”]
3	Find the y-intercept of the perpendicular bisector of the same segment.	<u>9</u> [or (0, <u>9</u>)]

Question #28: Math – Analytical Geometry

10 points per part

A triangle is placed in the coordinate plane so that it has one vertex at the origin, one vertex at the point (2,6), and another vertex at the point (8,0).		
1	Find the area of the triangle. Ignore units.	<u>24</u>
2	Find the tangent of the internal angle of the triangle located at the origin.	<u>3</u>
3	What is the name of the segment going from the origin to the point (5,3)? Use the one-word name that describes the role that this segment plays in the triangle.	<u>median</u>



Question #29: Social Studies – World History

10 points

This organization's Laboratory 12 designed the mechanism that killed Georgi Markov. Its then-chairman, Vladimir **Kryuchkov [KRYOOCH-kof]**, was part of the "gang of eight." The Vassiliev notebooks detail its operations in enemy territory. Preceded by the NKVD, Yuri Andropov headed this organization immediately prior to his ascension to General Secretary. Robert Hanssen helped this group get information on the FBI, and Aldrich Ames gave it information on the CIA, its American counterpart. Name this Soviet political spy organization.

Komitet Gosudarstvennoy Bezopasnosti [accept **Committee for State Security, do not accept "Glavnoye razvedyvatel'noye upravleniye" or "Main Intelligence Directorate"]**

Question #30: Science – Biology

10 points

Some animals are named for their **symbiotic [sim-bee-O-tik]** relationship with members of this **phylum [FIE-lum]**, such as **crinoid [KRIE-noid]** shrimp. Some animals in this phylum have a type of shell called a test, and these animals have **ossicles [OS-sih-kuls]** in their skin. One theory of the evolution of this phylum is the **asterozoa [as-ter-uh-ZOE-uh]** hypothesis. This phylum's **holothurian [ho-loe-THUR-ee-un]** class consists of sea cucumbers, while another class in this phylum consists mainly of sanddollars and sea urchins. Many animals in this phylum have five-point radial symmetry and scaly skin. Name this phylum that includes starfish.

echinodermata



Question #31: Math – Math Concepts

10 points

In the Moulton example of this construct, some lines are bent. The Moulton example is a projective type of this construct, which means that all of its lines intersect. The Argand Diagram is one of these objects used to represent complex numbers. Three noncollinear points can be used to define one of these objects. These objects are generated by a first-degree equation in three dimensions, and its normal vectors are in the same direction or its opposite at every point on this surface. Name these flat surfaces that extend forever.

planes

Question #32: Literature – British Literature

10 points

This author used the Serbo-Bulgarian War as a backdrop for a drama in which a “chocolate cream soldier” inherits a large fortune; that play takes its title from the opening line of the *Aeneid* [ay-NEE-id]. He also wrote of a munitions manufacturer donating funds to a charity which the title daughter is an officer in. Name this playwright of *Arms and the Man* and *Major Barbara* who wrote of the cockney girl Eliza Doolittle in *Pygmalion*.

George Bernard Shaw



Extra Question #1: Fine Arts – Classical/Opera

10 points

<p>This composer used a chord composed of the notes F, B, D-sharp, and G-sharp in the prelude to his opera that also includes a “liebestod [LEE-buh-stod],” or “love-death” section. In one of his works, Elsa's marriage to a knight who rides a boat drawn by swans is accompanied by a “Bridal chorus.” This composer's final opera is based on Wolfram von Eschenbach's epic about a knight who discovers the Holy Grail. Name this composer of the Arthurian operas <i>Parsifal</i>, <i>Lohengrin</i>, and <i>Tristan und Isolde</i> who also wrote the Ring Cycle.</p>	<p>Richard <u>Wagner</u></p>
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Extra Question #2: Math – Math Concepts

10 points

<p>A tree named for this person follows the heap property and can give back an original sequence by an in-order traversal. A shape named for this person is generated by the equation $X^3 + Y^3 - 3A^2XY = 0$, and it contains a loop. The product named for this person generates ordered pairs when applied to two sets. The coordinate system named for this person is equivalent to rectangular coordinates. Name this mathematician and philosopher credited for developing analytic geometry.</p>	<p>Rene <u>DesCartes</u></p>
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Extra Question #3: Social Studies – World History

10 points

The Happy Valley Racecourse hosted a gathering mourning this event that featured “Democratic Songs,” and was followed by 1.5 million people marching through Hong Kong. Sparked by the death of Hu Yaobang [yow-baeng], two weeks prior to it, Zhao Ziyang spoke that its targets “arrived too late.” Stuart Franklin snapped a photo during this event allegedly shows Wang Weilin standing alone in front of a tank. Name this 1989 uprising in Beijing, China.

Tiananmen Square Protests [accept June Fourth Incident]

Extra Question #4: Literature – British Literature

10 points

This man’s older brother announced his death of a chill in Paris, despite the presence of a man going by this name. One character assumed this person’s name in order to woo Cecily Cardew, and Gwendolen also pledged her love to a man with this name. The fictional younger brother of Jack Worthing, name this non-existent fictional character, the title character of a play by Oscar Wilde.

Ernest [accept *The Importance of Being Ernest*]



Extra Question #5: Science – Earth Science

10 points

A common system for classifying this pattern was modified by Glenn Trewartha in a way that, among other things, changes the way that highlands are handled. That system for classifying this pattern, which uses capital letter groups and lower case letter subgroups that include Mediterranean and marine west coast, is named for Vladimir Koppen. The overall change in this pattern is studied by a group set up by the UN called the IPCC, which has stated that this pattern is changing due to human actions. Give this term referring to the long-term weather patterns in an area.

climate



Extra Question #6: Social Studies – U.S. History

10 points per part

At this battle, George Washington erroneously thought he had fortified the fords along the eponymous river.		
1	Name this battle where General Howe’s knowledge of Trimble’s and Jefferis Fords proved crucial in this British victory, which was followed up by the capture of Philadelphia.	Battle of <u>Brandywine</u>
2	Howe was assisted at Brandywine by this general who would later surrender to the Americans at Yorktown.	Charles <u>Cornwallis</u> (or 1 st Marquess <u>Cornwallis</u>)
3	Another key moment in the Philadelphia campaign saw Howe send troops to Paoli and take on the regiment of this “mad” Brigadier General.	Anthony <u>Wayne</u>

Extra Question #7: Social Studies – U.S. History

10 points per part

Prior to this battle, Tenskwatawa convinced his forces that the opposing forces’ bullets could do no harm.		
1	Name this battle, fought in the capital of an Indian confederacy, during which American forces trounced the local Shawnee tribesmen. The local Yellow Jackets featured prominently, despite a number of leaders being killed.	Battle of <u>Tippecanoe</u>
2	This future President and governor of the Indiana territory led the victorious forces at Tippecanoe.	<u>William Henry Harrison</u> [prompt on “Harrison”]
3	The outcome of the battle of Tippecanoe led to this Shawnee and brother of Tenskwatawa to side with the British during the War of 1812.	<u>Tecumseh</u>



Extra Question #8: Math – Probability

10 points per part

Chevalier de Mere posed a problem that some mathematicians claim started the study of probability theory.		
1	De Mere’s question led to several letters between Pierre de Fermat and this other mathematician whose name is used for a triangular arrangement giving binomial coefficients.	Blaise <u>Pascal</u>
2	The problem that de Mere raised involved rolling a pair of dice 24 times and seeing if a double six came up at all. That problem can be solved by raising this number to the 24 th power.	<u>35/36</u> [or <u>0.972 repeating</u>]
3	Other early developments in probability theory involved letters between this mathematician and Jakob Bernoulli [bur-NOO-lee]. This mathematician and Isaac Newton are credited with independently developing calculus.	Gottfried Wilhelm <u>Leibniz</u>

Extra Question #9: Math – Probability

10 points per part

If an experiment consisted of choosing a card from a deck, then this would be a set listing all the cards in the deck.		
1	Name this set of all possible outcomes for an experiment. Give a two-word answer.	<u>sample space</u> [or <u>probability space</u>]
2	This term describes any subset of the sample space. Probabilities are typically assigned to these entities.	<u>event</u>
3	If you are picking a random card from a standard 52-card deck, what is the probability of picking a red three?	<u>1/26</u>



Question #1: Fine Arts – Art History

10 points

<p>One work in this city shows the flayed skin of St. Bartholemew and shows a beardless Christ looking down upon Charon ferrying the souls of the damned. This city's Stanze [STAHN-zay] della Segnatura includes a painting showing Plato walking next to Aristotle and is found in the Apostolic Palace. One church here shows god giving life to Adam on its ceiling. Name this city where Raphael's <i>School of Athens</i> can be found, as well as <i>The Last Judgement</i> and Michelangelo's paintings on the ceiling of the Sistine Chapel.</p>	<p>Vatican City (do not accept "Rome")</p>
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Question #2: Literature – British Literature

10 points

<p>The narrator of this poem encountered the title entity beside a pumice [PUH-mis] isle in Baiae's [BAY-ay's] bay. This poem describes leaves of fall as fleeing ghosts, and as "pestilence-stricken multitudes." This poem compares seeds to corpses within graves, until the intervention of a sibling of the title figure. Its speaker asks, "if Winter comes, can Spring be far behind?" Name this poem by Percy Shelley about an atmospheric phenomenon.</p>	<p><u>"Ode to the West Wind"</u></p>
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Question #3: Social Studies – U.S. History

10 points

<p>The negotiations involved in this agreement provided precedent for the concept of “implied powers.” The primary boundaries within this agreement were settled in the Adams-Onis Treaty. The Indiana Territory temporarily governed most of the territory gained in this 1803 agreement. In this agreement, President Thomas Jefferson agreed to buy land controlled by Napoleon. Name this agreement that saw American territory expand west of the Mississippi River.</p>	<p><u>Louisiana Purchase</u></p>
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Question #4: Math – Math Concepts

10 points

<p>The sum of the non-negative powers of the reciprocal of this value equal this value. This value equals the vertices [VER-tuh-sees] minus edges plus faces of a polyhedron, making it their Euler [OY-ler] characteristic. False negatives are classified as a type error of this value. This is the greatest value that gives the same result when it is added to itself as it does when it is multiplied by itself. Identify this least prime number whose multiples are defined as the even numbers.</p>	<p><u>two</u></p>
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Question #5: Science – Physics

10 points

The application of laws developed by this scientist sometimes depends on the creation of imaginary surfaces named for him. This person's name is often used for the general system of **cgs** [see jee es] units, and his name is used specifically for the cgs unit of magnetic flux density, which is the smaller version of the Tesla. One of this person's laws states that the divergence of a magnetic field is zero, while another relates electric field divergence to charge density. Those two equations are part of Maxwell's equations. Name this scientist who is also the namesake of the normal curve, or bell curve.

Carl Friedrich Gauss

Question #6: Literature – World Literature

10 points

This collection features a story in which a man, his slave, and a widow were all nearly executed on account of a stolen apple. Translated into French by Antoine Galland and English by Richard Burton, it opens with three sheiks collaborating to spare the life of a merchant who had accidentally killed the son of a jinn. Name this collection of tales told to King **Shahryar** [SHAHR-yahr] by **Scheherezade** [sheh-HAIR-uh-zahd], which includes the stories of Ali Baba, Sinbad the Sailor, and Aladdin.

The Arabian Nights' Entertainment [accept *The One Thousand and One Nights*; or *The Book of The Thousand Nights and One Night*; or *Alf Laylah wa Laylah*]



Question #7: Math – Geometry

10 points per part

Trapezoids have a pair of parallel sides.		
1	If a segment is drawn through the intersection point of the diagonals that is parallel to the two parallel sides, what is the relationship between that segment and the lengths of the two parallel sides? Give a two word answer.	<u>harmonic mean</u>
2	In which type of trapezoid is the other pair of opposite sides congruent?	<u>isosceles</u> trapezoid
3	Find the area of an isosceles trapezoid if its nonparallel sides each have a length of five units, and the bases have lengths of ten units and four units. Ignore units.	<u>28</u> square units

Question #8: Math – Geometry

10 points per part

At least one thing can be built from pentagons.		
1	Name the Platonic solid whose faces are pentagons.	<u>dodecahedron</u> [or <u>dodecahedra</u>]
2	The pentagon is the only regular shape that can be used to build a Platonic solid but cannot be used for this covering of a plane sometimes called tiling.	<u>tessellation</u> [accept word forms]
3	In order to be able to tessellate the plane, the degree measure of the interior angles of a regular polygon must be a factor of what number? Give the least positive correct answer.	<u>360</u> degrees



Question #9: Literature – British Literature

10 points per part

He described Washington, DC as a headquarters for “tobacco-tinctured saliva” in his <i>American Notes</i> .		
1	Name this writer whose father was the inspiration for the character of Wilkins Micawber in <i>David Copperfield</i> .	Charles <u>Dickens</u>
2	Featuring illustrations by George Cruikshank, a number of Charles Dickens stories, including “The Hospital Patient” and “Mr. Minns and his Cousin” were published in a collection entitled <i>Sketches</i> by this pseudonym.	<u>Boz</u>
3	Dickens created this resident of Cloisterham who was betrothed to Rosa Bud at an early age. Rumors abound concerning his mysterious death, because the novel featuring this title character was left unfinished at Dickens’ death.	<u>Edwin Drood</u> [accept either]

Question #10: Literature – British Literature

10 points per part

The Palace of Green Porcelain was found within the territory inhabited by this futuristic race.		
1	Name this race that, according to one observer, only inhabited the earth because their counterparts had found daylight intolerable. When Weena almost drowned, no fellow members of this race came to help.	<u>Eloi</u> [eh-LOY]
2	The Eloi are encountered in the year 802,701 AD in this science fiction novel.	<i>The <u>Time Machine</u></i>
3	<i>The Time Machine</i> was penned by this author of <i>The Invisible Man</i> .	Herbert George “H.G.” <u>Wells</u>



Question #11: Science – Biology

10 points per part

When one organism is harmed by this type of relationship, it is classified as parasitism [PA-ruh-sih-tis-im], and it is classified as mutualism if both organisms benefit.		
1	Name this class of relationships between species.	<u>symbiosis</u>
2	In this type of symbiosis, one organism benefits while the other one is for the most part unaffected.	<u>commensalism</u> [accept word forms]
3	This type of plant that grows on another type of plant is usually classified as exhibiting commensalism. Many ferns and mosses are examples of this type of plant.	<u>epiphytes</u>

Question #12: Science – Biology

10 points per part

This process involves water traveling through plants.		
1	Name this process that includes evaporation from leaves.	<u>transpiration</u> [accept word forms]
2	Much of the evaporation that takes place at the end of transpiration goes through these tiny holes on leaves.	<u>stomata</u> [or <u>stomates</u> or <u>stomas</u>]
3	This is the outward pressure exerted by water in a cell which prevents a plant from wilting.	<u>turgor</u> pressure [or <u>turgidity</u>]



Question #13: Fine Arts – Classical/Opera

10 points per part

This composer’s works are divided into an early period, when he strongly imitated the classical idiom of his time, a middle period when he composed <i>Fidelio</i> , and a late period when he composed the <i>Diabelli Variations</i> .	
1	Name this composer of the <i>Waldstein</i> [VALD-steen] and <i>Moonlight</i> piano sonatas.
2	Beethoven suffered from this condition, which forced him to use conversation notebooks, and which he suffered from completely for over a decade at the end of his life.
3	Beethoven composed 18 of these works for four performers, including three named for Count <i>Razumovsky</i> [rah-zoo-MOF-skee], and a late period one which ended with the “ <i>Grosse Fuge</i> [GROSE-uh FYOOG]” until Beethoven's publisher asked him to replace it.

Ludwig van **Beethoven**

deafness

string quartets [prompt on **quartets**]

Question #14: Fine Arts – Classical/Opera

10 points per part

One of this man's pupils was Beethoven, and his 45 th symphony includes an extra movement where the performers were instructed to put out their candles and leave the room.	
1	Name this employee of the Esterhazy family, who composed 104 symphonies, including the “Surprise,” “Alleluia,” and “Farewell” symphonies.
2	Joseph Haydn's final symphony is named for this city, which also names the broader collection of his final 12 symphonies where he partially composed them. Those symphonies include the “Drumroll” and “The Clock.”
3	Haydn composed an oratorio named for these annual weather phenomena. Antonio Vivaldi composed four violin <i>concerti</i> [kon-CHEER-tee] named for them.

Franz Joseph **Haydn**

London

seasons



Question #15: Social Studies – World History

10 points

<p>Two invasions of this country were halted at the Battles of Bun’ei [BOON-“eye”] and Koan [KOE-ahn]. This country instigated a war by attacking the Marco Polo Bridge after it sank the USS <i>Panay</i>. The Charter Oath outlined the planned modernization of this country as part of the Meiji [MAY-jee] Restoration. Name this country that surrendered in World War II following two atomic bombs being dropped on Hiroshima and Nagasaki.</p>	<p>Empire of Japan [or Nippon-koku or Nihon-koku]</p>
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Question #16: Science – Astronomy

10 points

<p>In 2012, NASA’s <i>Living With a Star</i> program launched probes to this region. In 2014, NASA announced the existence of electromagnetic waves called Whistlers in this region that accelerate particles. Temporary parts of this region may be created by coronal mass ejections, while the outer part has protons from the solar wind and very energetic electrons. This region is located a few thousand miles from the Earth’s surface but barely exists over the poles. Name this radiation belt.</p>	<p>Van Allen radiation belt [prompt on radiation belt]</p>
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Question #17: Miscellaneous – Pop Culture

10 points

During a musical performance on this show, a picture of Pope John Paul II was ripped in half by **Sinead** [shi-NAID] O'Connor. Featuring Don Pardo as its long-time announcer, its alumni include Eddie Murphy and Adam Sandler, whose "Operaman" character would make guest appearances on "Weekend Update." Name this long-running NBC sketch comedy show.

Saturday Night Live [accept **SNL**]

Question #18: Literature – U.S. Literature

10 points

In this novel, the main character is lashed with a riding crop after refusing to replace a fireplace he destroyed with a single hammer blow; that fireplace belonged to Dominique Francon. After seeing a change in its design, the Cortlandt House was sabotaged by its architect to get back at Peter Keating. Name this novel about the career of architect Howard Roark, by Ayn Rand.

*The **Fountainhead***



Question #19: Science – Biology

10 points

<p>This animal class includes species almost made extinct by Polynesian rats, the tuataras [twah-TAH-rahhs]. Some extinct members of this animal class are now classified as eurypsids [yoo-ree-AP-sids], which have much in common with animals with two skull openings, the diapsids [die-AP-sids]. This class includes testudines [teh-STOOD-eh-nees] such as terrapins that are characterized by their shells. This class also includes squamata, which have scales. Name these amniote [AM-nee-ote] vertebrates including geckos, crocodiles, and lizards.</p>	<p><u>reptiles</u> [or <u>reptilia</u>]</p>
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Question #20: Social Studies – U.S. History

10 points

<p>This election saw Libertarian John Hospers win an electoral vote from a faithless elector. During this election, the loser became known as the “triple-A candidate” for alleged support for “amnesty, abortion, and acid,” and the source of that quote was a running mate that was forced to withdraw after revelations concerning electroshock therapy. Resulting in only D.C. and Massachusetts going to George McGovern, name this election which saw Richard Nixon earn a second term, only to resign soon afterwards due to Watergate.</p>	<p>United States Presidential Election of <u>1972</u></p>
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Question #21: Social Studies – World History

10 points per part

After the English victory over the Scots at Flodden, she sent her husband the banner and bloody coat of James IV.		
1	Name this woman supplanted at court by Cardinal Thomas Wolsey whose marriage was annulled by Thomas Cranmer.	Catherine of Aragon [prompt partial answer]
2	Catherine of Aragon was the first of this English king’s six wives. After divorcing Catherine, he married Anne Boleyn [BOE-lin] .	Henry VIII [prompt on Henry]
3	After publishing his “Declaration of the Seven Sacraments Against Martin Luther,” Henry VIII was granted this title by Pope Leo X.	Defender of the Faith [accept Fidei Defensor , prompt on F.D.]

Question #22: Social Studies – World History

10 points per part

This disaster was brought about by the mold <i>Phytophthora [fie-tof-THOR-ah] infestans</i> , which causes late blight.		
1	Name this disaster that led some people to rub chloric acid and manganese dioxide on the diseased portion of a certain vegetable. The first proactive steps from London involved shipping corn.	Irish Potato Famine [accept Great Irish Famine of 1845 or Gorta Mor , prompt on Irish or Potato Famine]
2	This Prime Minister overruled the treasury in overseeing the repeal of the Corn Laws in order to alleviate the effects of the famine.	Sir Robert Peel
3	The corn that Peel had imported to Ireland was actually shipped from this nation, which saw a major influx of Irish immigrants during the famine.	United States of America [accept equivalents]



Question #23: Math – Trigonometry

10 points per part

Some historians believe that this unit began being used because ancient astronomers believed that there are 360 regular days in a year and 5 holidays that are separate.		
1	Name this angle unit that is sometimes divided into minutes and seconds.	<u>degrees</u>
2	Nine-tenths of a degree is equal to this unit, which was designed to divide a right angle into 100 units.	<u>gradian</u> [or <u>gon</u>]
3	Convert pi over ten radians into degrees.	<u>18</u> degrees

Question #24: Math – Trigonometry

10 points per part

One of the first trigonometry tables was this person's <i>On the Size of Chords Inscribed in a Circle</i> , which he included in his <i>Almagest</i> [AL-muh-jest].		
1	Name this person born in Egypt around 90 AD whose work had a major impact on astronomy.	Claudius <u>Ptolemy</u>
2	Ptolemy [TOEL-uh-mee] compared the length of a chord across an arc to the angle of the arc. Give the measure of a central angle such that the chord across the arc it subtends has the same length as the radius of the circle.	<u>60</u> degrees [or <u>pi over 3</u> radians or <u>one-third pi</u> radians]
3	The radius of a circle has the same length as one of the sides of these regular polygons inscribed in the circle.	<u>hexagon</u> [or <u>6-gon</u>]



Question #25: Literature – U.S. Literature

10 points per part

In one poem, this writer described seeing children at recess, before passing fields of grazing grain and the setting sun.		
1	Name this poet who compared the stillness in a room to that between “heaves of storm” in “I Heard a Fly Buzz When I Died.”	Emily Elizabeth <u>Dickinson</u>
2	In Emily Dickinson’s “I Taste a Liquor Never Brewed,” the narrator claims that he or she will drink more when these winged insects renounce their drams.	<u>butterflies</u>
3	In “I’m Nobody! Who are you?” Dickinson describes one who tells one’s name to a bog like this other animal. Mark Twain wrote of one named Dan’l Webster.	<u>frog</u>

Question #26: Literature – U.S. Literature

10 points per part

The last line of this poem describes a dream of a “sea-journey on the highway across America,” and contains numerous repetitions of the phrase “I’m with you in Rockland.”		
1	Written “for Carl Solomon,” name this work that contains the line “I saw the best minds of my generation destroyed by madness.”	“ <u>Howl</u> ”
2	“Howl” was written by this Beat Generation poet, who dedicated “Kaddish” to his mother Naomi.	Alan <u>Ginsberg</u>
3	In another Ginsberg poem, the narrator asks many questions of Walt Whitman while inside one of these businesses “in California.”	<u>supermarket</u> [accept <u>A Supermarket in California</u> , do not accept equivalents]



Question #27: Science – Physics

10 points per part

Classical physics is often used to analyze the motion of an object on an inclined plane, or ramp.		
1	Give the name of the diagram often used when there are several forces acting on an object, such as for a moving object on an inclined plane. This diagram is also called a force diagram.	<u>free body</u> diagram [do not accept “free diagram” or “body diagram”]
2	One of the forces acting on such an object is the force due to gravity. Give the common word used to represent the force of gravity.	<u>weight</u>
3	This two-word phrase equals the output force divided by the input force for any machine, including an inclined plane. The maximum value of this quantity for an inclined plane is the cosecant of its angle of elevation.	<u>mechanical advantage</u>

Question #28: Science – Physics

10 points per part

This term often refers to missiles.		
1	Give the general term for these objects that, assuming they stay close to Earth and experience negligible air resistance, follow a path that approximates a parabola.	<u>projectiles</u>
2	This quantity is the distance over the ground that a projectile flies through the air before hitting the ground. This quantity can be found by setting the height equal to zero and solving for the horizontal position.	<u>range</u>
3	In terms of v for velocity and g for gravitational field strength, give an expression for the range of a projectile fired at a 45 degree angle if it lands at the same height it is fired from.	<u>v²/g</u> [vee squared divided by jee] [or equivalents]



Illinois Masonic Academic Bowl
2015 Sectional Tournament

Round # 8
5th Section
Toss-up Questions

Question #29: Math – Math Concepts

10 points

<p>The diagram demonstrating Desargues' [day-zahrg's] theorem includes this many lines and this many three-line intersections. The probability of getting a sum equal to this number with a roll of two standard dice equals the probability of getting a sum of four, which is one-twelfth. This value is the fourth positive triangular number because it equals the sum of the numbers from one to four. A polyhedron with this many sides has a central angle of thirty-six degrees. Identify this number, the base of the decimal number system.</p>	<p><u>ten</u></p>
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Question #30: Social Studies – U.S. History

10 points

<p>Despite the machinations [ma-kuh-NAY-shuns] of Patrick Tailfer and Thomas Stevens, this colony prohibited slavery after its establishment. Initially, landowners were limited to 500 acres, as agreed upon by its Board of Trustees. Resisting a Spanish invasion at the Battle of Bloody Marsh, during the Revolution local forces organized three invasions of Florida. Name this colony whose charter was granted to a group led by James Oglethorpe, the southernmost of the thirteen colonies.</p>	<p>Province of <u>Georgia</u></p>
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Question #31: Science – Chemistry

10 points

After Ulrich Schneider passed this threshold in 2013 using potassium, he suggested that his studies could explain dark energy. Fermi energy is defined at this condition, and this value holds for all quantum critical points. Walther Nernst stated that this condition could not be reached in a finite number of steps. There is no entropy in a perfect crystal at this condition according to the third law of thermodynamics. Name this condition that exists at approximately negative 460 degrees Fahrenheit and negative 273 degrees Celsius.

absolute zero [or **zero kelvin**]

Question #32: Literature – World Literature

10 points

This writer compared himself to Philip of Macedon in a letter describing his ascent of Mount Ventoux. One of his collections was originally published as *Rerum vulgarium fragmenta*. He wrote of the invasion of Hannibal in “Africa,” while his eponymous literary form is a combination of an octave and a sestet. The author of the collection *Il Canzoniere* [kan-zoe-NYEH-ray], name this author of many poems dedicated to Laura, the namesake of the Italian sonnet.

Petrarch [PEE-trahrk or PEH-trahrk] [accept Francesco **Petrarca**]



Extra Question #1: Fine Arts – Art History

10 points

This person painted a man holding back a curtain to reveal George Washington as a child wielding an axe in *Parson Weems' Fable*. He painted the birthplace of Herbert Hoover in West Branch, which was in this artist's home state. He painted a house in Eldon which had a pointed arch shaped window, with Byron McKeeby standing in front of it. Name this Iowa-born painter who showed a woman standing next to a man with a pitchfork in *American Gothic*.

Grant Wood

Extra Question #2: Science – Biology

10 points

This genus includes the extinct **leporphagus** [leh-PO-fuh-gus] species that ate rabbits and the **dirus** [DEE-rus] species that became extinct after humans arrived in America. This genus has a rufus species that has a reddish color and almost became extinct before being reintroduced in the Great Smoky Mountains. The best known examples are in the lupus species, including the Australian predators from Southeast Asia commonly called dingos. Name this genus that includes coyotes, wolves, and dogs.

canis [accept canines or canids, do not accept dogs]



Extra Question #3: Math – Math Concepts

10 points

One test of these numbers is named for the infinite monkey theorem, while another is named for the birthday paradox. Nineteen thousand, nine hundred thirty-seven is often used in the Mersenne twister, which commonly is used to create these numbers, as is the thermal noise in resistors. These numbers are associated with their namesake walks, which are based on an object moving one unit for each step but not consistently in the same direction. Identify these numbers that can consist of a long string of independent digits.

random numbers

Extra Question #4: Social Studies – World History

10 points

This person hired Scaptius to enforce the terms of a loan he made with the city of Salamis. He caused a scandal when he could not provide a valid reason for divorcing his first wife Claudia. Captured at the Battle of Pharsalus, shortly thereafter he was named governor of **Cisalpine** [SIS-ul-peen] Gaul. This person had **Strato** [STRA-toe] hold a sword as he committed suicide after a second loss at **Philippi** [FIL-ih-pie] to Octavian. Name this assassin, to whom Julius Caesar said, “et tu” before dying.

Marcus Junius Brutus [accept Quintus Caepio Brutus or Brute]



Extra Question #5: Literature – World Literature

10 points

One character in this play references a lost container of oil in numerous interruptions. Its main character is confused with **Heracles [HEHR-uh-klees]**, and suggests that Xanthias carry their donkey. The chorus consisting of the title animals chants “brekekekex koax koax.” Name this play in which **Aeschylus [ES-kuh-lus]** and **Euripides [yoo-RIH-pih-dees]** compete in **Dionysus’ [die-uh-NIE-sus’s]** contest, written by **Aristophanes [ar-ih-STO-fah-nees]**.

*The **Frogs** [accept **Batrachoi**]*



Extra Question #6: Social Studies – World History

10 points per part

Under this man’s rule, the Office of National Intelligence, or DINA, systematically purged leftists through Operation Colombo.		
1	Name this Chilean leader who converted a mining base in the Atacama into a concentration camp, and also ordered the killing of Orlando Letelier [leh-TEH-lee-ehr], which came via a car bomb in Washington, D.C.	Augusto <u>Pinochet</u>
2	With the help of the United States, Pinochet [PEE-noe-shay] organized a coup [koo] that overthrew this Marxist President of Chile.	Salvador <u>Allende</u>
3	During the 1970s, a number of South American governments coordinated the “disappearances” of leftists and radicals through this eponymous multinational intelligence organization.	Operation <u>Condor</u>

Extra Question #7: Social Studies – World History

10 points per part

These people fought a bloody civil war shortly after Wayan Capac came down with smallpox.		
1	Huascar [WAHS-kahr] lost the fight for the throne of these people to his elder brother, who was later executed and succeeded by Manco Capac.	<u>Incan</u> People
2	Huascar’s older brother, Atahualpa, was captured by Spanish conquistadores under the charge of this explorer. He was later assassinated by forces loyal to his captain, Pedro de Almagro.	Francisco <u>Pizarro</u>
3	While in Panama, Pizarro arrested this explorer and discoverer of the “South Sea” under the orders of Pedro Arias de Avila.	Vasco Nuñez de <u>Balboa</u>



Extra Question #8: Science – Physics

10 points per part

These are the objects that move through electric circuits.		
1	Name these negatively charged objects often found in atomic orbitals.	<u>electrons</u>
2	Electrons, muons, and taus are three of the six particles in this category.	<u>leptons</u>
3	The number of leptons is conserved in most, but all circumstances. One theory states that a decrease in the number of leptons is matched by an increase in the number of these particles that include lambdas and sigmas.	<u>baryons</u>

Extra Question #9: Science – Physics

10 points per part

The Standard Model uses 17 elementary particles to describe the universe, though there are 61 particles if you count antiparticles and particles with different colors.		
1	Name this person who shared the 2013 Nobel Prize in Physics with Francois Englert when the elementary particle named for him was confirmed to exist.	Peter <u>Higgs</u>
2	The existence of the particle was confirmed by this organization whose research center is located at the border between France and Switzerland.	<u>CERN</u> [or <u>European Council for Nuclear Research</u> or <u>Organisation Europeen pour la Recherche Nucleaire</u>]
3	Some of the initial experiments leading up to the discovery of the Higgs boson were done using this particle accelerator at Fermilab in Illinois that closed in 2011.	<u>Tevatron</u>