Question #1: Social Studies

10 points

The majority decision in this Supreme Court case states "The government of the United States has been emphatically termed a government of laws, and not of men." Seven years after this case, the principle it established was expanded in *Fletcher v. Peck.* If this case had resulted in a writ of mandamus [man-DAY-mus], there is a good chance that the U.S. Secretary of State—who was the defendant in this case—would have ignored it. This case settled the issue of the "Midnight Judges" appointed by President John Adams. This decision invalidated Section 13 of the Judiciary Act of 1789. Name this 1803 case that established the principle of judicial review.	*__Marbury__ v. __Madison__* [accept either underlined name]

Question #2: Science

10 points

Animals in this phylum have a labrum [LAY-brum] that looks like an upper lip, and some animals in this phylum have appendages in front of their mouths called chelicerae [kuh-LISS-ur-ay]. Some animals in this phylum have dorsal ocelli [oh-SELL-"eye"], which are able to detect overhead light. The Cambrian ["CAME"-bree-un] explosion featured many *Marrella [muh-RELL-uh]* and trilobytes ["TRY-low-bites"] from this phylum. Barnacles and krill belong to a mostly aquatic class of this phylum, the crustaceans ["crust"-AY-shunz]. This invertebrate phylum is characterized by exoskeletons, jointed legs, and segmented bodies. Name this largest animal phylum that includes spiders and insects.	**arthropod**s or **arthropod**a [accept **euarthropod**a or **euarthropod**s]

Question #3: Literature

10 points

A character in this novel states "Conscience and cowardice are really the same things." Another character in this novel later contradicts that by saying conscience "is the divinest thing in us"; because of that, he is going to marry an actress he had just argued with. Unfortunately, the actress had killed herself. Later in this novel, the man who wished to marry gets into an argument with a painter and kills him; he then arranges for Alan Campbell to dispose of the body. Alan Campbell and Sibyl [SI-bul] Vane commit suicide in this novel, and the title character murders Basil Hallward. Name this novel in which the title portrait ages while the title character stays young, written by Oscar Wilde.	*The **Picture of Dorian Gray***

Question #4: Miscellaneous

10 points

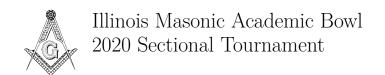|	
This technology uses adaptive frequency-hopping spread spectrum to decrease interference. This technology allows the creation of a piconet [PEE-koh-net], also known as a personal-area network, with a master device and slave devices. This technology, like some Wifi networks, uses a frequency of 2.4 gigahertz [GIG-uh-"hurts"]. AirPods use this technology to connect to iPhones. Name this technology developed during the 1990s by the telecommunications company Ericsson that uses ultra-high-frequency radio waves to allow electronic devices to communicate wirelessly over short distances.	**Bluetooth**

Question #5: Social Studies

10 points

An expansion of this place took land from Joint Base Myer-Henderson Hall and extended this place to a monument consisting of three curved spires. In this place there is a monument consisting of a white pyramid on a rock base. The Netherlands Carillon [KAR-ul-lon] is between this place and a monument depicting the U.S. flag being planted at Iwo Jima [EE-woh JEE-muh]. This place is on land that was taken from Robert E. Lee's wife. South Washington Boulevard is between this place and the Pentagon. Presidents Taft and Kennedy are buried here. Name this location near Washington, D.C. that includes the Tomb of the Unknown Soldier.	**Arlington** National **Cemetery**

Question #6: Science

10 points

The volume amount named after this person is about 10 to the 31st power cubic light years and is usually in the shape of a sphere. The unit of time named for this person is about 14.4 billion years, which is the reciprocal of the constant named for this person. Those values are based on this person's law, which was theorized from the observation that farther objects have bigger red·shifts. This person is also the namesake of a "tuning-fork diagram" that is used to classify galaxies, and of a space telescope that has been in orbit since 1990. Name this American astronomer whose law is about the expansion of the universe.	Edwin (Powell) **Hubble**

Question #7: Literature

10 points per part

	Some of the techniques this author used are called "Camera Eye" and "Newsreel".	
1	Name this author of *Manhattan Transfer* and the *U.S.A.* trilogy.	John **Dos Passos** [prompt on **Passos**]
2	John Dos Passos had a falling out with this author of *For Whom the Bell Tolls* after the murder of José Robles [hoh-SAY ROH-blayss] during the Spanish Civil War.	Ernest (Miller) **Hemingway**
3	Though Dos Passos is not mentioned by name in this Hemingway memoir, he is believed to be the "pilot fish" mentioned in it. The second chapter of this memoir is "Miss Stein Instructs".	*A **Moveable Feast***

Question #8: Literature

10 points per part

	At the end of this story, the protagonist is about to clasp his wife but "feels a stunning blow upon the back of the neck".	
1	Name this story about a man who told about an order "declaring that any civilian caught interfering with the railroad, its bridges, tunnels or trains will be summarily hanged".	"An **Occurrence at Owl Creek Bridge**"
2	In the story, what does the gray-clad soldier—who turns out to be a Federal scout—ask for when he rides up to the protagonist Farquhar's [FAR-kwar'z] gate?	**drink** of **water** [accept either underlined part]
3	"An Occurrence at Owl Creek Bridge" is in this writer's collection *Tales of Soldiers and Civilians*.	Ambrose (Gwinnett) **Bierce**

Question #9: Mathematics

10 points per part

It is tricky to use this law to find angle measures because it cannot differentiate between supplementary angles.			
1	Name this law used to solve a triangle if the angle measures are known but only one side length is known.	law of **sines** [do not accept answers containing "cosine"]
2	Find the hypotenuse of a right triangle if a leg of length 12 is opposite an acute angle whose sine is 0.6.	**20** units
3	Find the sine of an angle if it is opposite a side of length 5, and in the same triangle, a side of length 8 is across from an angle whose sine is 0.4.	0.**25** or **1/4**

Question #10: Mathematics

10 points per part

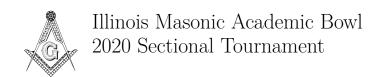|		
This polygon has 35 diagonals.		
1	Name this polygon with ten sides.	**decagon**
2	Find the measure, in degrees, of an internal angle in a regular decagon [DEK-uh-gahn].	**144** degrees
3	Find the number of edges of a decagonal [dek-AG-uh-nul] pyramid.	**20** edges

Question #11: Social Studies

10 points per part

	This psychologist described a pyramid whose bottom level is labeled "physiological" and includes concepts like breathing and food.	
1	Name this person who put those physiological considerations on the bottom of his hierarchy of needs.	Abraham (Harold) **Maslow** [accept **Maslow**'s hierarchy of needs]
2	This is the highest level on the hierarchy of needs. It includes morality and creativity.	**self-actualization** [or **self-actualizing** or being **self-actualized**]
3	Maslow described his hierarchy in a paper titled "A Theory of Human" *this concept.* This same concept was used in the title of his book, where it was paired with "personality".	**Motivation** [do not accept variations]

Question #12: Social Studies

10 points per part

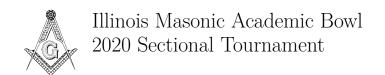|	Sigmund Freud wrote a book on *The Interpretation of* these phenomena.	
1	Name these involuntary sensations that occur while people are sleeping.	**dream**s
2	Freud used dreams to study this class of psychological disorders that are distressing and painful. Freud viewed these disorders as manifestations of anxiety.	psycho**neuroses** or psycho**neurosis**
3	Freud analyzed this dream he had in which his friend Otto treated one of his patients.	**Irma's injection**

Question #13: Science

10 points per part

	This principle limits fermions [FAIR-mee-ahns] and is the reason that atomic orbitals are filled the way they are.	
1	What principle states that fermions cannot occupy the same quantum state within a system at the same time?	**Pauli exclusion** principle [prompt on partial answer]
2	This person is the namesake of several rules about the way orbitals are filled, including the rule that electrons always enter empty orbitals before pairing up.	Friedrich **Hund** [accept **Hund**'s rules]
3	The aufbau [AWFF-bao] principle says that electrons fill lower atomic orbitals before occupying higher levels. One exception is this element, which has a filled $3d$ orbital and only one $4s$ electron.	**copper** [accept **Cu**]

Question #14: Science

10 points per part

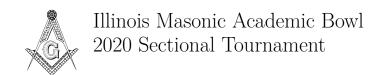|	This element is the defining characteristic of several materials called "lime".	
1	Name this alkaline earth metal that is important in bone formation.	**calcium** [accept **Ca**]
2	Calcium sulfate di·hydrate is this mineral. It defines 2 on the Mohs hardness scale.	**gypsum**
3	This ion is also important in bones. It and calcium are in milk and the mineral apatite ["appetite"].	**phosphate**

Question #15: Fine Arts

10 points

After Eliel Saarinen [EL-ee-el SAR-uh-nun] designed the Des Moines Art Center, this architect designed an addition to it, though he denied that the windows spell his name. This architect also designed a glass and metal figure in the Cour Napoléon [koor nah-poh-lee-aw] that is surrounded by three smaller figures. This architect used glass triangular shapes to design what used to be the tallest building in Asia, the Bank of China Tower in Hong Kong. He followed that project with the design for Cleveland's Rock and Roll Hall of Fame. Name this Chinese-American architect who designed the glass pyramid used as the entrance to the Louvre [loov].	I(eoh) M(ing) **Pei**

Question #16: Literature

10 points

This goddess was honored by a series of races for women held every four years in the Olympic stadium. This goddess was hung from the clouds with two anvils hanging from her feet. The Milky Way was formed when Hercules tried to nurse from this goddess while she was sleeping, and she pushed him away. This goddess later sent two giant snakes to try to kill Hercules and his twin. Hephaestus [huh-FESS-tuss] made a throne for this goddess that did not allow her to stand up. That was in revenge for her throwing him out of Olympus. By some accounts, Hephaestus is the fatherless child of this goddess. This goddess was vengeful towards many women who had affairs with her husband. Name this wife of Zeus.	**Hera** [prompt on **Juno**]

Question #17: Mathematics

10 points

The margin of error for a sample mean is calculated by multiplying the *z*-factor times the standard deviation and dividing by this function of the sample size. In the Lindeberg-Lévy statement of the central limit theorem, this function is applied to the sample size before multiplying by the difference of the sample average and expected value. The geometric mean of two numbers is found by applying this operation to the product of the numbers. This function is applied to variance to calculate the standard deviation. A graph of this function is the upper half of a parabola that opens to the right. Name this function equivalent to raising to the one-half power.	square **root** [prompt on **radical**; accept raising **to the 1/2 power** or **raising to the 1/2** power before the end]

Question #18: Social Studies

10 points

After this person contracted syphilis, he chose not to go on expeditions led by Diego de Nicuesa [nee-KWAY-suh] and Alonso de Ojeda [oh-HAY-dah]. A few years later, this person helped Diego Velázquez de Cuellar [kway-yar] conquer Cuba. Shortly after this person left Cuba, he destroyed his ships so that his followers could not desert him. This person was supported by the Totonac people when he founded Veracruz in 1519. This person left Pedro de Alvarado in charge of his primary conquest, leading to the Massacre in the Great Temple. Name this leader who killed Montezuma in Tenochtitlán [tay-nohch-teet-LAHN] when he conquered the Aztec Empire.	Hernan(do) **Cortés**

Question #19: Literature

10 points

One of this author's characters is the daughter of a man who nailed himself into his attic and threw the hammer out the window. According to this author, that woman refused to marry a man who insisted she give birth to a son first, and her return to his old home caused Clytie to burn it down. That woman, Rosa Coldfield, lived at Sutpen's Hundred and told her story to a Harvard student who appears in another novel by this author. That student is Quentin Compson. Name this author of *Absalom, Absalom!* and *The Sound and the Fury.*	William (Cuthbert) **Faulkner** [or William Cuthbert **Falkner**]

Question #20: Science

10 points

A recent international effort with this person's name in it used an isotopically ["ice-oh-topically"]-enriched silicon crystal and was supported by the National Institute of Standards and Technology. The number named for this person is divided by molar volume to get the Loschmidt constant. The law named for this person was supported by Stanislao Cannizzaro [STAN-iss-lau kahn-nee-ZAHR-oe]'s work, which explained experimental discrepancies by using dissociation. This person's law was stated shortly after Gay-Lussac's law, making it the last component of the ideal gas law. Name this scientist who determined the relationship between volume and number of molecules and who is the namesake of the number of atoms in a mole.	Amedeo **Avogadro** [or Lorenzo Romano Amedeo Carlo **Avogadro**, conte di Quaregna e Cerreto]

Question #21: Social Studies

10 points per part

	One of these Catholic tribunals was set up by Ferdinand II and Isabella I in Spain in 1478.	
1	Name this group set up shortly before Jews and Muslims were told to convert to Catholicism or leave Spain.	Spanish **Inquisition**
2	This person became the first grand inquisitor in Spain in 1483. While he was in charge, about 2,000 people were burned at the stake.	Tomás de **Torquemada**
3	This term was used to describe former Muslims and their descendants in Spain who converted to Catholicism, usually under pressure.	**Morisco**s

Question #22: Social Studies

10 points per part

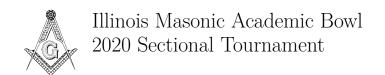|	The Organisation of African Unity, or OAU, lasted from 1963 to 2002.	
1	This Ethiopian emperor hosted its first summit.	Haile **Selassie** ["highly" **suh-LASS-ee**] (I) [or Lij Tafari **Makonnen** or Ras **Tafari**]
2	This country was the last country to join. Throughout much of its history, the OAU organized sanctions against this country due to its apartheid government.	(Republic of) **South Africa**
3	There were several rivalries within the OAU, including a rivalry between Kwame Nkrumah [KWAH-may en-KROO-muh] of Ghana and this leader of Senegal.	Léopold Sédar **Senghor**

Question #23: Fine Arts

10 points per part

	This composer's younger brother Michael wrote 43 symphonies, but this composer wrote even more.	
1	Name this Austrian composer of 106 symphonies, including the *Surprise* symphony.	(Franz) Joseph **Haydn** ["HIDE-in"]
2	Haydn's symphonies numbered 93 through 104 are collectively named for, and mostly written in, this city. He wrote them later than his Paris Symphonies.	**London**, England [accept **London** Symphonies]
3	Haydn's 103rd symphony is given this nickname due to its opening.	The **Drumroll**

Question #24: Fine Arts

10 points per part

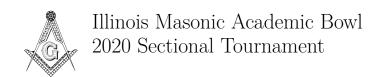|	According to legend, there was a riot at the 1913 Paris opening of this Russian composer's ballet *The Rite of Spring.*	
1	Name this composer who also wrote the ballets *The Firebird* and *Pulcinella [pul-chee-NEL-luh].*	Igor (Fyodorovich) **Stravinsky**
2	In this Stravinsky ballet, the title character is a puppet who is brought to life by a Charlatan but killed by another puppet.	***Petrushka***
3	All of the ballets mentioned in this question were commissioned by this founder of the Ballets Russes [bal-ay roos].	Sergei **Diaghilev** [dee-AH-guh-leff]

Question #25: Science

10 points per part

	This diverse group of organisms includes algae [AL-jee] and protozoa [proh-tuh-ZOH-uh].	
1	Name these usually small organisms that live in or on water and drift with the current.	**plankton**
2	These single-celled algae have a cell wall of silica [SIL-ih-kuh] and, as a group, generate a significant amount of the world's oxygen.	**diatom**s [**"DIE"-uh-tahm**z]
3	As opposed to plankton, these animals live on the bottoms of bodies of water. Their name reflects their ecological region.	**bentho**s [accept **benthic** zone]

Question #26: Science

10 points per part

	This organ is the main part of the integumentary [in-TEG-yoo-MEN-tuh-ree] system.	
1	Give the common name of this organ that contains the epidermis, dermis, and subcutis [sub-"CUTE"-iss].	**skin**
2	These glands in the skin tend to be near hair follicles and release an oily substance.	**sebaceous** [seh-BAY-shuss] glands
3	These muscles attached to hair follicles can cause the hair to stand on end.	**arrector pili** muscles [prompt on partial answer]

Question #27: Literature

10 points per part

	This woman's husband Clifford is paralyzed during World War I.	
1	Name this woman whose lover is Oliver Mellors.	Lady (**Constance** "**Connie**" **Reid**) **Chatterley** [accept any underlined name]
2	Lady Chatterley is a major character in a novel by this author. He also wrote *Women in Love*.	D(avid) H(erbert) **Lawrence**
3	This sister of Lady Chatterley does not get along with Oliver Mellors, but helps her get out of her marriage.	**Hilda** Reid [prompt on **Reid**]

Question #28: Literature

10 points per part

	This novel begins at the Central London Hatchery and Conditioning Center.	
1	Name this novel in which Bokanovsky's [boe-kuh-NAWV-skee'z] Process is used to clone fertilized eggs to create more people.	***Brave New World***
2	This author wrote *Brave New World*.	Aldous **Huxley**
3	This is the lowest caste in *Brave New World*. These people wear black and are sometimes called "semi-morons".	**epsilon**s

Question #29: Science

10 points

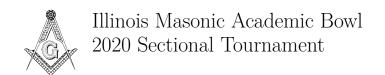|	
Radiant intensity is measured in units of this quantity over a solid angle. Irradiance is measured in units of this quantity over area. Radiant flux is measured in the same units as this quantity. In uniform circular motion, this quantity is the dot product of torque and angular velocity. In an electric circuit, this quantity is the product of current and electric potential difference. For linear motion, this quantity equals the dot product of force and velocity. Name this quantity, equal to work per unit time, that can be measured in watts.	**power** [prompt on **watt**age or **watt**s before the end]

Question #30: Literature

10 points

A crime novel set mostly in this city eventually moves to Staten Island, where Arkady Renko releases some animals belonging to John Osborne. That novel is by Martin Cruz Smith. Another novel involves this city's literary community, which has a trade union called MASSOLIT. That novel, which alternates between this city and ancient Jerusalem, features this city's fictional writers Berlioz and Ponyrev [POHN–yuh-reff]. In another novel, this city is abandoned and burned soon after Anatole Kuragin and Andrei Bolkonsky are injured. Name this city that is the setting of *Gorky Park*, *The Master and Margarita*, and *War and Peace.*	**Moscow**, Russia [or **Moskva** or **Moscow**, Soviet Union or **Moscow**, USSR]

Question #31: Mathematics

10 points

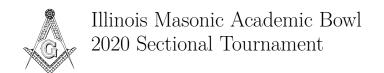|	
Examples of this concept would be solutions to the *Entscheidungs·problem* [ent-SHY-doonks-"problem"] and to Hilbert's 10th problem, but such solutions don't exist. The textbook popularly called "CLRS" is an *Introduction to* this concept. Examples of this concept are called "greedy" if they always make the choice that seems best at a given time, which might not lead to the best overall solution. The worst-case complexity of these things is described using expressions like "$n \log n$" in big O ["oh"] notation. Computer science students often learn about several examples of this concept that can be used to sort lists, such as quick·sort. Give this Arabic-derived term for a specific procedure used to solve a class of problems.	**algorithm**s [prompt on computer **program**s]

Question #32: Social Studies

10 points

Francois [fran-swah] Darlan said that this person was the only American he would talk to, but this person sent his deputy Mark Clark to talk to Darlan anyway. This person's work with Darlan in North Africa was supported by Franklin Roosevelt and Winston Churchill. This person worked with Bernard Montgomery to plan Operation Overlord. This leader of Operation Torch became the Supreme Commander of the Allied Expeditionary Forces in Europe. This leader would later become the namesake of an anti-communist doctrine developed by John Foster Dulles [DUL-iss], his secretary of state. Name this person who was elected U.S. president in 1952 and 1956.	Dwight (David "Ike") **Eisenhower**

Extra Question #1: Literature

10 points

In one novel by this author, the Arc de Triomphe [tree-awmf] turns to sand and the Eiffel Tower is converted into a zoo. In that novel, this author wrote about Pollo Phoibee [POY-oh foh-EE-bee], who transforms into a brother of King Philip II, who this author refers to as "El Señor". In another novel by this author, Regina is hanged by soldiers, and her lover ends up marrying Catalina and having an affair with Lilia. That man, who demanded 2 million dollars from two Americans interested in mining sulfur, is portrayed by this author on his deathbed. Name this Mexican author of *Terra Nostra* and *The Death of Artemio Cruz.*	Carlos **Fuentes** (Macías)

Extra Question #2: Science

10 points

According to the theory of relativity, when you add two vectors representing this quantity, you should divide by 1 plus the quantity product of the vector magnitudes divided by the speed of light squared. A current density vector is found by multiplying charge density times this vector. This quantity is crossed with magnetic field strength and multiplied by charge to give the force of a magnetic field. Name this quantity that equals the rate of change of position, whose own rate of change is acceleration, and whose magnitude is speed.	**velocity**

Extra Question #3: Fine Arts

10 points

Franz Lehár [LAY-har] wrote an operetta about the love affair between this composer and Napoleon's sister. Even though this composer did not write for the piano, Franz Liszt ["list"] wrote a set of six very difficult grand études [AY-toodz] for piano based on this composer's work. Johannes Brahms wrote variations on a theme by this composer, and Sergei Rachmaninoff wrote a rhapsody on the same theme. Those works are based on the 24th and last entry in a series of very difficult pieces this composer wrote for violin. Name this Italian composer and virtuoso violinist who wrote 24 Caprices [kuh-PREE-sus] for Solo Violin.	Niccolò **Paganini**

Extra Question #4: Social Studies

10 points

Vergerio [vurg-EER-ee-oh] wrote fictional letters supposedly from this person in response to Petrarch. Petrarch discovered many of this person's letters to Atticus in a Verona library. Clodius declared this person to be an exile, and years later this person unsuccessfully defended Titus Annius Milo [TEE-tuss AN-ee-us MEE-loh] after Milo killed Clodius. This person's attempt to pit Octavian against Mark Antony was unsuccessful, and Antony ordered this person's hands to be cut off after he was killed. This person and Gaius Antonius Hybrida were the targets of the unsuccessful Catiline [KAT-uh-leen] conspiracy. Name this Roman consul and lawyer famous for his skills as an orator.	(Marcus Tullius "Tully") **Cicero**

Extra Question #5: Mathematics

10 points

When the stopping-time parameter of the negative binomial distribution is an integer, it becomes the distribution named for this person. A line named for this person is formed by extending the opposite sides of a hexagon until they meet, and makes sense when the vertices of the hexagon are on a conic section. An arrangement of numbers named for this person contains the tetrahedral numbers, triangular numbers, and counting numbers along parallel diagonals. In that arrangement of numbers named for this person, each number equals the sum of the numbers just above it. Identify this namesake of a triangle of numbers that has 1's going down the sides.	Blaise **Pascal** [accept **Pascal** distribution or **Pascal**'s theorem or **Pascal**'s triangle]

Extra Question #6: Social Studies

10 points per part

This person said our government was "made for the people, made by the people, and answerable to the people" in a reply to Robert Hayne in 1830.		
1	Name this orator and lawyer who served as a Congressman from New Hampshire and Massachusetts and as secretary of state.	Daniel **Webster**
2	The second time that Webster became secretary of state, he helped pass this package of five bills that—among other things—admitted California as a free state.	**Compromise of 1850**
3	Webster formulated a test of whether preemptive self-defense is necessary. The test was named after this ship that was set on fire by the British and sent over Niagara Falls in late 1837.	***Caroline***

Extra Question #7: Social Studies

10 points per part

This event occurred December 16, 1773 on board the ships *Dartmouth*, *Eleanor*, and *Beaver*.		
1	Name this protest by American colonists against the British, in which the Sons of Liberty threw certain cargo into the water.	Boston **Tea Party**
2	The Boston Tea Party was in part a protest against this governor, who refused to allow the ships to leave without paying a duty.	Thomas **Hutchinson**
3	The protest was also against laws named for this British Chancellor of the Exchequer. Most of the taxes were repealed in 1770, but the tax on imported tea remained.	Charles **Townshend**

Extra Question #8: Mathematics

10 points per part

	This term describes several theorems, including the calculus theorem that gives the relationship between derivatives and integrals.	
1	Give this word that is also used for theorems "of algebra" and "of arithmetic".	**fundamental** theorem(s)
2	The fundamental theorem of arithmetic states that all integers greater than 1 have a unique prime factorization. What is the prime factorization of 64?	$\underline{2^6}$ or $\underline{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}$ [do not prompt on partial answers]
3	The fundamental theorem of algebra says that non-constant polynomials have roots. Find both roots of the function "x squared plus $20x$ plus 64".	$\underline{-4}$ and $\underline{-16}$ [either order; do not accept or prompt on positive answers]

Extra Question #9: Mathematics

10 points per part

	This shape is the set of all points in a plane that are the same distance from a fixed point and a fixed line.	
1	Name this shape generated by the equation "y equals x squared".	**parabola**(s) [or **parabolic** curve]
2	Find the x-coordinate of the vertex of the parabola generated by the equation "y equals x squared plus $8x$ plus 3".	$\underline{-4}$ [accept $(\underline{-4}, -13)$; do not accept or prompt on "4"]
3	Find the y-coordinate of the focus of the parabola generated by the equation "y equals x squared".	$\underline{1/4}$ [or 0.$\underline{25}$; accept $(\underline{0}, 1/4)$ or $(\underline{0}, 0.25)$]