Illinois Masonic Academic Bowl
2020 Sectional Tournament

Round 1
1st Section
Toss-up Questions

Question #1: Mathematics

10 points

An integral along a path or curve is commonly named for this shape even when the path is not this shape. In polar coordinates, this shape is generated by graphing r equals the secant of theta. Playfair's axiom, which begins with one of these shapes and a point not on it, is equivalent to Euclid's [YOO-klid'z] parallel postulate, which describes where two of these shapes meet. A transversal is one of these shapes that crosses two others of these shapes. Name these entities that are infinitely long and straight.	**line**s

Question #2: Literature

10 points

In this novel, a light truck swerves to hit a turtle, making the turtle flip. A character in this novel who has not been home for four years wraps the turtle in his coat to take it home to his little brother, and on the way home he shows it to a former preacher, who goes home with him. Later in this novel, that little brother—Al—falls in love with Agnes Wainwright. By the end of this novel, their family is abandoned by Connie Rivers, even though Rose of Sharon is pregnant. Much of this novel is set on Route 66 on the way to California. Name this novel about the Joad family from Oklahoma, written by John Steinbeck.	*The* ***Grapes of Wrath***

Question #3: Miscellaneous

10 points

This person helped write and sing Adam Lambert's song "Fever". At the 2010 MTV Video Music Awards, this person wore a dress made of raw beef. In an episode of *The Simpsons* in which Lisa writes a blog titled "Truth Teller", this person appears in Springfield and performs the song "Little Monsters", which is what she usually calls her fans. This person was nominated for an Academy Award for the song "'Til It Happens to You" and won an award for the song "Shallow". Name this co-star of the movie *A Star Is Born* whose hits include "Alejandro", "Poker Face", and "Born This Way".	Lady **Gaga** or [Stefani (Joanne Angelina) **Germanotta**]

Question #4: Science

10 points

Some animals in this class go for several months each year during which they drink water but do not eat, which is their brumation [broo-MAY-shun] period. An early animal in this class is the hylonomus ["hi"-LAH-nuh-mus], which lived during the Late Carboniferous [kar-buh-NIFF-ur-uss] period. The tuataras [too-uh-TAH-ruhz] in this class live only in New Zealand. Many of the animals in this class are either Testudines [tes-TOO-duh-nees] or Squamata [skwah-MAH-tuh]. The sauropsids [suh-RAHP-sidz] evolved into birds and these animals. These ectothermic [EK-toh-THUR-mik] vertebrates have dry, scaly skin. The dinosaurs belonged to this class. Name this class of animals that includes turtles and lizards.	**reptile**s [or **reptilia**]

Question #5: Social Studies

10 points

Alexander Berkman and Emma Goldman started a league opposed to this process, leading to two-year jail sentences for them. When this process was introduced in the United States, people could hire a substitute or pay 300 dollars to avoid it. The ability of wealthy people to avoid this process was a factor behind a massive riot in New York City, which turned into a race riot, in 1863. During the Vietnam War, many men burned cards they were supposed to carry with them; those cards were supposed to show they took part in this process. Some people avoid this process by being declared conscientious objectors. Name this process of compulsory enlistment into the armed forces.	military **draft** or military **conscription** [or being **draft**ed or **conscript**ed; accept answers that additionally specify it's registration for the draft; prompt on **Selective Service** System; prompt on **military service**]

Question #6: Literature

10 points

In one novel by this author, Jacquin Labarre [jak-wan luh-bar]—who is the host of an inn—refuses to feed or house a traveler after hearing who that traveler is. This author then describes how that traveler uses the name "Monsieur Madeleine" and becomes the mayor of a town. In another novel by this author, a fictional version of the poet Pierre Gringore [gran-gor] watches an attempted kidnapping that is foiled by Captain Phoebus [FEE-buss]. That kidnapping is ordered by Claude Frollo in this author's book about Esmeralda and Quasimodo. Name this author who wrote about Jean Valjean [zhahn val-zhahn] in *Les Misérables* [lay mee-zair-ahb'l] and who wrote *The Hunchback of Notre-Dame*.	Victor (Marie) **Hugo**

Question #7: Fine Arts

10 points per part

This musical is based on a comic strip by Harold Gray.		
1	Name this musical about a little orphan who is taken in by "Daddy" Warbucks.	***Annie***
2	Annie sings this optimistic song that says the title concept is "always a day away". After Annie sings this song, Franklin Roosevelt gets his Cabinet to sing it.	"**Tomorrow**"
3	In contrast, Miss Hannigan sings this song stating "Some women are dripping with diamonds; some women are dripping with pearls. Lucky me! Lucky me! Look at what I'm dripping with."	"**Little Girls**"

Question #8: Fine Arts

10 points per part

This musical was inspired by a biography written by Ron Chernow [CHUR-"now"].		
1	Name this Lin-Manuel Miranda musical featuring songs such as "The Room Where It Happens" and "The Reynolds Pamphlet".	***Hamilton***
2	After "The Reynolds Pamphlet", Hamilton's wife Eliza sings this song while destroying letters written between them.	"**Burn**"
3	At the beginning of "The Room Where It Happens", Aaron Burr talks about the renaming of Clermont Street in honor of this general, saying that his legacy is secure.	General Hugh **Mercer**

Question #9: Science

10 points per part

Bars and torrs are units for this physical quantity.		
1	Name this quantity defined as force per unit area.	**pressure**
2	This rule states that in incompressible fluid flow, the total pressure, plus the quantity density times gravitational field strength times height, is constant.	**Bernoulli**'s [bair-NOO-lee'z] principle
3	This set of equations that use continuity, momentum, and energy are more versatile than Bernoulli's principle. There is a million-dollar prize available to anyone who proves that they have well-behaved solutions.	**Navier-Stokes** [nahv-yay "stokes"] equations

Question #10: Science

10 points per part

This quantity is usually measured in amperes.		
1	Name this quantity equal to the rate of flow of electric charge.	electric **current**
2	This quantity is a measure of a specific object's ability to carry electric current. It equals current divided by electric potential difference, and it also is the reciprocal of resistance.	**conductance** [do not accept "conductivity"]
3	According to this law, the electric current generated by a current-carrying wire is proportional to the current divided by the square of the distance from the wire. It is usually expressed using an integral.	**Biot-Savart** [bee-oh sah-var] law

Question #11: Social Studies

10 points per part

After people tried to find this route for centuries, Roald Amundsen finally navigated it in 1903.		
1	Give this term for a route from the Atlantic Ocean to the Pacific involving what is now Canada.	**Northwest Passage**
2	In 1611, this English explorer was kicked off his ship by his crew while searching for the Northwest Passage. A strait, river, and bay are now named for him.	Henry **Hudson**
3	This half-brother of Sir Walter Raleigh [RAH-lee] inspired searches by writing *A Discourse of a Discovery for a New Passage to Cataia* [kuh-TIE-uh]. He died while returning from Newfoundland [NOO-fund-lund].	Humphrey **Gilbert**

Question #12: Social Studies

10 points per part

When neither side abided by this document, Pope Innocent III annulled it, leading to the First Barons' War.		
1	Name this document signed in 1215 in Runnymede, England that gave legal rights to barons and lesser rights to serfs.	**Magna Carta** (Libertatum)
2	This king signed the Magna Carta. He died the next year and was succeeded by his son, Henry III.	King **John** (Lackland)
3	Henry III defeated this king of France, who aided the barons and for a time claimed to be the king of England.	**Louis VIII** [or **Louis Coeur-de-lion** or **Louis the Lion**-heart; prompt on **Louis**]

Question #13: Literature

10 points per part

Some fictional dogs are good dogs, and some fictional dogs are bad dogs.		
1	This Daniel Defoe character got the captain's dog and two cats when he survived a shipwreck. The dog helped him hunt so he could survive on an island.	**Robinson Crusoe** [accept either]
2	In this novel by Charles Dickens, Bill Sikes owns the dog Bull's-eye, who looks "as if he were anxious to attach himself to [the title character's] windpipe without delay."	***Oliver Twist*** [do not accept or prompt on "Oliver"]
3	In this play by William Shakespeare, Crab is "the sourest-natured dog that lives". Crab is owned by Launce, the servant of Proteus in this play.	*The* ***Two Gentlemen of Verona***

Question #14: Literature

10 points per part

The title character in this play is told to "Beware the ides of March."		
1	Name this William Shakespeare play about a leader of ancient Rome.	*(The Tragedy of)* ***Julius Caesar***
2	In *Julius Caesar*, Mark Antony gives a speech beginning with these three words to define his audience. Those words are followed by "lend me your ears".	"**Friends, Romans, countrymen**"
3	Before Antony's speech, Brutus used this adjective to describe Caesar, explaining why he killed him. Antony says several times in his speech that Brutus says Caesar was this adjective.	**ambitious**

Question #15: Social Studies

10 points

A large part of this U.S. state is taken up by the Colville Indian Reservation, and another of its reservations includes part of Mount Adams. One of the earliest white settlements in what is now this state was Fort Nez Percés [PER-suh] near what is now the town of Walla Walla. Though most of this state's major cities are in its west near Puget [POO-jut] Sound, its second-most populous city is the site of Gonzaga University, which is Spokane ["spoke-Ann"]. This state contains the original headquarters of Amazon and Microsoft and is the location of Mount Rainier [ruh-NEER]. Name this state whose capital is Olympia and whose most populous city is Seattle.	**Washington** (state)

Question #16: Science

10 points

These objects are classified into the C-group, S-group, X-group, or eleven other groups according to Tholen classification, which is similar to the SMASS classification of these objects. The moon Dactyl [DAK-tul] goes around one of these objects called Ida ["EYE"-duh]. The spacecraft OSIRIS-REx is collecting a sample from one of these objects named Bennu. The spacecraft *Dawn* orbited one of these objects named Vesta before orbiting the largest of these objects, which is also the dwarf planet nearest to Earth. Name these rocks, most of which are in a belt between Mars and Jupiter.	**asteroid**s [accept **minor planet**s or **planetoid**s; do not prompt on "planet(s)"]

Question #17: Literature

10 points

In one novel by this author, two characters move to Weatherbury after the woman rejects the man's marriage proposal. In that novel, Gabriel goes to a hiring fair in a town that this author later used as the primary setting of a novel in which a man breaks off an engagement with Lucetta Templeman. In that later novel, this author wrote about two characters named Elizabeth-Jane, one of whom is auctioned off with her mother to Richard Newson. Name this author who wrote about Bathsheba Everdene in *Far from the Madding Crowd* and about Michael Henchard in *The Mayor of Casterbridge*.	Thomas **Hardy**

Question #18: Fine Arts

10 points

The oldest temple in this city is dedicated to the bodhisattva [boh-dee-SAHT-vuh] Kannon, is entered through the Thunder Gate, and was built in the seventh century. A tower that opened in 2012 in this city is the tallest tower in the world and, other than the Burj Khalifa, the tallest structure. That tower is this city's Skytree. Another tower in this city is painted white and orange but shaped like the Eiffel Tower. This city's Imperial Hotel was designed by Frank Lloyd Wright, though little remains of his work. Name this capital city whose National Diet Building houses the national legislature and was designed by Watanabe Fukuzo [wah-tah-nah-bay foo-koo-zoh].	**Tokyo**, Japan

Question #19: Social Studies

10 points

This leader had an affair with Margherita Sarfatti ["margarita" sar-FAH-tee], who wrote a biography about him, but she left his country around the time his government published the *Manifesto of Race* and passed racial laws. When King Zog refused to renew the Treaty of Tirana, this person made Albania a protectorate. During the Abyssinia [ab-uh-SIN-ee-uh] Crisis, this leader ignored the League of Nations and invaded Ethiopia. This person often used bound wood as a symbol for his political movement. Name this leader of Italy who led the Fascist Parties and was killed by Italians near the end of World War II.	Benito (Amilcare Andrea) **Mussolini**

Question #20: Science

10 points

The log of vapor pressure is related to this quantity in the Antoine [ant-wahn] equation. According to the Stefan [STEFF-un]-Boltzmann law, radiant emittance is proportional to the fourth power of this quantity. In a Carnot [kar-noh] cycle, two steps have constant heat, and this quantity is constant in the two other steps. The change in energy in a system equals the heat capacity times the change in this quantity. Gibbs free energy equals enthalpy minus entropy times this quantity. In the ideal gas equation, this quantity is multiplied by the number of moles and the gas constant. Name this quantity that can be measured in kelvins.	(absolute) **temperature**

Question #21: Literature

10 points per part

Images depicting these sisters were often made on the bottoms of bowls and tops of jars.		
1	Name this group of ugly sisters that included Stheno [s'THEE-noh] and Euryale [yoor-"EYE"-uh-lee]. They were immortal, and the other sister in this trio was mortal.	**Gorgon**s
2	Name the mortal Gorgon whom Perseus beheaded.	**Medusa**
3	This king sent Perseus on a mission to get the head of Medusa. He was interested in Perseus's mother Danaë [DAN-ay-ee].	**Polydectes** [pah-lee-DEK-teez]

Question #22: Literature

10 points per part

Identify these mortals from Greek mythology:		
1	This person killed Hector but was killed when Paris shot him in the heel.	**Achilles**
2	This person used a ball of thread to escape the Labyrinth after he killed the Minotaur [MIN-oh-tor].	**Theseus** [THEE-see-uss]
3	This person finished off the Calydonian [kal-uh-DOH-nee-un] Boar after Atalanta injured it.	**Meleager** [mel-ee-AY-gur]

Question #23: Science

10 points per part

This element has the highest known electrical and thermal conductivity.		
1	Name this element whose Latin name is "argentum" [ar-JEN-tum].	**silver** [prompt on **Ag**]
2	Silver sulfide leaves a black mark on silver, which is known by this term.	silver **tarnish**
3	Silver is used as a catalyst to create formaldehyde [for-MAL-duh-"hide"] from this compound.	**methanol** [or **methyl alcohol**; accept **wood alcohol**; do not prompt on "alcohol"]

Question #24: Science

10 points per part

Nickel and this element are the most abundant elements in the Earth's core.		
1	Name this primary ingredient in steel.	**iron** [accept **Fe**]
2	In this process, steel or iron is coated with zinc to prevent rust.	**galvanization** [or **galvanizing**]
3	This compound was the first one found to protect iron through passivation ["passive"-AY-shun]. This compound is sometimes called "aqua fortis".	**nitric acid** [or **HNO_3**; prompt on **spirit of niter**]

Question #25: Social Studies

10 points per part

In October 2019, the United States announced that it was sending an additional 1,800 troops to this country.		
1	Name this country that murdered the journalist Jamal Khashoggi [kuh-SHOHG-ee] in Turkey in 2018 and which has played a major role in the Yemen Civil War.	(Kingdom of) **Saudi Arabia** [or al-Mamlakah al-**Arabiyah** as-**Suudiyah**]
2	This person became the king of Saudi Arabia in 2015.	**Salman** bin Abdulaziz Al Saud [prompt on **Saud**]
3	This president of Yemen moved to Saudi Arabia in 2015 when the Houthi [HOO-thee] movement took over Yemen's presidential palace.	Abdrabbuh Mansur **Hadi**

Question #26: Social Studies

10 points per part

At the federal level, this value was first established by the 1938 Fair Labor Standards Act, which set it at 25 cents.		
1	Name this value that was increased at the federal level to $7.25 in 2009, though it is higher in many places.	**minimum** (hourly) **wage** (rate)
2	All of the major Democratic 2020 presidential candidates supported raising the minimum wage to this value. The Raise the Wage Act would increase it to this value by 2025.	$**15** per hour
3	A recent major minimum-wage study compared this state with the federal minimum wage to a neighboring state with a higher minimum wage. This state's governor, Tom Wolf, wants to raise the minimum wage.	**Pennsylvania**

Question #27: Mathematics

10 points per part

Trigonometric [TRIG-uh-noh-"metric"] functions have this property because they satisfy the relationship "f of x always equals f of the quantity x plus some fixed constant".		
1	Name this property that a function has if it repeats the same values regularly.	**period**icity or **period**ic function
2	This periodic shape is generated by tracing the path of a point on the rim of a rolling circle.	**cycloid**
3	Find the period of the function "f of x equals 7 plus 5 times the tangent of $3x$". Assume x is in radians.	**pi over 3** or **pi divided by 3** or **1/3 pi**

Question #28: Mathematics

10 points per part

Consider a histogram with equal-sized bins and the measured values along the horizontal axis.		
1	What quantity would be on the vertical axis? It might be relative or absolute.	(relative or absolute) **frequency**
2	This term describes histograms that are lopsided rather than approximately symmetric. Their mode differs significantly from their mean.	**skew**ed histograms [accept **skew**ness]
3	Find the relative frequency of a value if an experiment involved 40 total measurements and the value was measured 6 times. Give your answer as a decimal.	0**.15**

Question #29: Literature

10 points

Near the beginning of this short story, the narrator states "A wrong is unredressed when retribution overtakes its redresser." This story's narrator says another character, "did not perceive that my smile now was at the thought of his immolation." Later in this story, the narrator demonstrates that he is a mason by taking out a trowel, and he eventually uses that trowel to wall up an entrance·way, trapping somebody inside. The person trapped during this story is Fortunato ["fortune"-AH-toh]. Name this short story about Montresor taking revenge by luring his enemy using a large container of wine, written by Edgar Allan Poe.	"The **Cask of Amontillado**"

Question #30: Science

10 points

In double slit-interference, there is constructive interference where the distance between slits, times the sine of the angle a ray makes with the normal, is an integer multiple of this property. The Bragg condition for constructive interference is that $2d$ sine theta is an integer multiple of this property. This quantity is fairly large for radio waves but very small for gamma rays and X-rays. This quantity equals a wave's speed divided by frequency. For visible light, this quantity ranges from 380 to 740 nano·meters. Give this term for the distance between successive wave crests.	**wavelength**

Question #31: Social Studies

10 points

Many countries have a Martyrs' Day; *this* country's Martyrs' Day commemorates a 1964 effort to take down an American flag and replace it with this country's flag. That incident may have influenced the creation of the 1977 Torrijos [toh-REE-hohss]-Carter Treaties between this country and the U.S., which went into effect at the end of 1999 and abolished the Hay-Bunau-Varilla [boo-"NO" vah-REE-yah] Treaty. During Operation Just Cause in 1989, the U.S. captured this country's ruler, Manuel Noriega [man-oo-EL noh-ree-AY-gah]. Name this country whose independence from Colombia in 1903 was supported by the U.S. to build a canal between the Atlantic and Pacific Oceans.	(Republic of) **Panama** or (República de) **Panamá**

Question #32: Mathematics

10 points

In Thales' [THAY-leez'] theorem, this type of segment is the diameter of a circle. The length of the altitude drawn to this segment is the geometric mean of the lengths of the segments the altitude divides this segment into. The altitude drawn to this segment creates two new triangles that are similar to the original. The length of this segment is the *numerator* in the triangle-based definition of secant and in the *denominator* in the triangle-based definition of sine. The length of this segment is represented by the largest number in a Pythagorean triple. Name this segment whose length is represented by the letter c in the equation "a squared plus b squared equals c squared".	**hypotenuse** of a right triangle [prompt on (longest) **side** of a right triangle; do not prompt on answers containing "leg"]

Extra Question #1: Fine Arts

10 points

Rebecca Clarke, who performed on this instrument, wrote a sonata for the piano and this instrument. While a soloist on cello represents the title character in Richard Strauss's [reek-hart shtrowss'z] *Don Quixote*, a soloist on this instrument represents Sancho Panza. Béla Bartók died while writing a concerto for this instrument for William Primrose to perform. This is the lead instrument in Hector Berlioz's *Harold in Italy*. The lowest string on this instrument is pitched an octave below middle C. Name this instrument that joins with a cello and two violins to form a string quartet.	**viola**

Extra Question #2: Science

10 points

This organ has curled pieces of bone called turbinates [TUR-buh-nits] or conchae [KON-kee], and it also has the major and minor alar cartilages. The top of this organ has the ethmoid bone, which is also known as the cribiform [KREE-buh-form] plate. This organ is just above and in front of the palatine [PAL-uh-tyn] bones. One of the purposes of this organ is to be a passageway to the brain's glomerulus [gloh-MAIR-yoo-luss]. Surgery on the cartilage in the middle of this organ is called septoplasty [SEP-toh-plass-tee], and other surgeries on this organ are called rhinoplasty. The sinus cavities are above and next to this organ. Name this principal organ of the olfactory system that has two nostrils.	**nose**

Extra Question #3: Literature

10 points

This author started one novel with the protagonist on the wrong train, thinking he is going to Cremona. This author's protagonist in that novel teaches at Waindell College even though it has few Russian students. At the end of the short first chapter of another novel by this author, the protagonist writes "Look at this tangle of thorns." That novel is supposedly based on *The Confession of a White Widowed Male*. In that novel, this author portrays a protagonist who had a relationship with Annabel Leigh and then goes after Dolores Haze. Name this author of *Pnin* who wrote about Humbert Humbert in *Lolita*.	Vladimir (Vladimirovich) **Nabokov** [nah-BOH-kawf]

Extra Question #4: Mathematics

10 points

Efforts to perform this action systematically and efficiently can lead to the table-maker's dilemma. Edward Lorenz noticed that performing this action in seemingly inconsequential ways can have a major impact when he developed the butterfly effect. A common form of this process is equivalent to either subtracting 1/2 and performing the ceiling function [pause] or adding 1/2 and performing the floor function. This process makes a number larger when the first eliminated digit is greater than 5, and it makes a number smaller when the first eliminated digit is less than 5. The eliminated digits are in the least significant places. Name this approximation process that might be done "to the nearest whole number".	**round**ing [prompt on **approximating** or **approximation**s]

Extra Question #5: Social Studies

10 points

Part of this place is the Great Bitter Lake, which was the location of the Yellow Fleet during the late 1960s and early '70s. The Convention of Constantinople was an international agreement over this piece of infrastructure, continuing a policy that Ferdinand Marie de Lesseps [duh les-ep] had agreed to. The United Nations Emergency Force Peacekeepers were used to end a crisis over this place that involved a failed alliance between France, the United Kingdom, and Israel. That crisis occurred after this infrastructure was nationalized in 1956 by Gamal Abdel Nasser. Name this waterway connecting the Mediterranean Sea to the Red Sea.	**Suez Canal** [prompt on partial answer]

Extra Question #6: Mathematics

10 points per part

This way to write the equation for a line is often more convenient than slope-intercept form and can easily be simplified into slope-intercept form.		
1	Name this form expressed by the equation "y minus y-sub-1 equals m times the quantity x minus x-sub-1".	**point-slope** form
2	Find the y-intercept of the line whose equation is "y minus 9 equals 2 times the quantity x minus 2".	**5** [accept $y = 5$ or $(0, 5)$; do not accept "$(5, 0)$"]
3	Give the equation, in point-slope form, of the line tangent to the graph of "y equals x squared" at the point where x equals 5. Use the point of tangency as the point in your equation.	$\boldsymbol{y - 25 = 10(x - 5)}$

Extra Question #7: Mathematics

10 points per part

This concept is used to find denominators when adding or subtracting fractions.		
1	Give this term for the smallest positive number that two given numbers are both a factor of. Don't include the word "denominator" in your answer.	**least common multiple** or **lowest common multiple** [accept **LCM**; accept **smallest common multiple**]
2	Find the least common multiple of 12 and 20.	**60**
3	Find the smallest integer greater than 1 that is a factor of the least common multiple of 13 and 77.	**7**

Extra Question #8: Literature

10 points per part

One character in this novel sees a picture of herself and Lydia in *Life* magazine.		
1	Name this novel about the Smales [SMAY-ulz] family and their relationship with the title servant.	***July's People***
2	*July's People* was written by this South African novelist who died in 2014. She also wrote about the businessman Mehring in *The Conservationist*.	Nadine **Gordimer**
3	In this other novel by Gordimer, Rosa has the title relationship with a deceased anti-Apartheid ["apart-aid"] activist. Rosa is arrested for aiding her childhood friend Baasie in a violent revolt.	***The Burgher's Daughter***

Extra Question #9: Literature

10 points per part

This character says that her eyes are dazzled and that her trembling knees refuse to support her.		
1	Name this title character of a play based on mythology who tells her nurse Oenone [ee-NOH-nee] about her love for her stepson.	**Phèdre** [fed-ruh]
2	The play *Phèdre* was written by this French author. He also wrote *Andromaque*.	Jean(-Baptiste) **Racine**
3	Jean Racine had a rivalry with this author of *Le Cid* [leh seed].	Pierre **Corneille** [kor-neh]