

#### Round # 1 1<sup>st</sup> Section Toss-up Questions

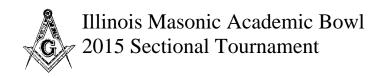
## **Question #1: Math – Math Concepts**

10 points

The symmetry of this quadrilateral is dihedral	<u>square</u> s
[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.	

### **Question #2: Social Studies – World History**

Allied forces in this country, as part of Operation Bertram,	Arab Republic of <b>Egypt</b>
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.	



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## **Question #3: Science – Chemistry**

10 points

This element is commonly used to isolate silicon from	<u>carbon</u> [prompt on <u>C</u> ]
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.	

## **Question #4: Fine Arts – Classical/Opera**

This composer's Ave [AH-vay] Verum Corpus was his final	Wolfgang Amadeus Mozart
completed piece of liturgical music. His symphonies include	
ones named for Prague and the Haffner family. His 41 <sup>st</sup>	
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 <i>Eine Kleine Nachtmusik</i>	
[EYE-nuh KLIE-nuh NAKT-myoo-sik].	

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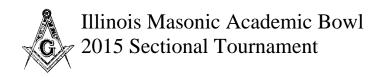
#### **Question #5: Literature – U.S. Literature**

10 points

The narrator of this poem compares himself to an apple	"Mending Wall"
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."	

## **Question #6: Social Studies – Geography**

This state is home to the Misty Fjords National Monument,	Alaska	
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.		



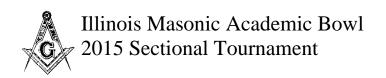
## **Question #7: Science – Biology**

10 points per part

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

## **Question #8: Science – Biology**

Huı	mans have twelve pairs of these bones.	
1	Name these bones that surround several organs such as the heart and lungs.	<u>rib</u> s
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.	costal cartilage [prompt on hyaline cartilage]



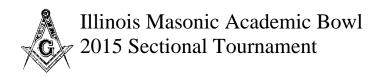
## Question #9: Social Studies - Religion

10 points per part

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

## **Question #10: Social Studies – Religion**

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



#### Question #11: Math - Statistics

10 points per part

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

#### Question #12: Math - Statistics

Ans	swer 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>residual</u> s
2	If you fit a line to the two points (2,8) and (5,20), what should be the slope of the line?	4
3	On that line, what is the residual for the point (7,31)?	3

#### **Question #13: Literature – U.S. Literature**

10 points per part

	s "memory play" is narrated by a poet that works in a e 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.	The Glass Menagerie
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 Williams
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**

1	nis writer satirized Hollywood moguls through the	
cł	aracters of Bobby Gould and Charlie Fox in Speed-the-	
P	ow.	
	Name this dramatist who wrote about a junk shop	David <u>Mamet</u>
1	owner's plans to steal back a coin he sold in American	
	Buffalo.	
2	This other David Mamet [MA-met] play featuring a	Glengarry Glen Ross
	robbery concerns the theft of prime leads [leeds] by	
	Shelly Levene and Dave Moss, two real estate	
	salesmen.	
3	Following Speed-the-Plow, Mamet wrote a one-act	<u>Hell</u> [accept equivalents]
	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.	

#### Round # 1 3<sup>rd</sup> Section Toss-up Questions

#### **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.

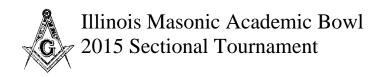
sales tax [accept excise tax until
"value-added", prompt on tax

#### **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.				

#### <u>desert</u>s



#### Round # 1 3<sup>rd</sup> Section Toss-up Questions

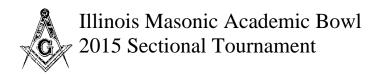
#### **Question #17: Literature – British Literature**

10 points

The prelude to this work describes an orphan who destroyed	<b>Beowulf</b>
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.	

## **Question #18: Social Studies – U.S. History**

This country hosted the ceremony for the resolution of the	Mexico [or United Mexican States]
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.	



#### Round # 1 3<sup>rd</sup> Section Toss-up Questions

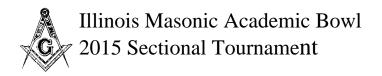
## **Question #19: Science – Biology**

10 points

A common blood coagulant [koe-A-gyoo-lunt] combines	citric acid [prompt on citrus]
this acid with dextrose and sodium citrate [SIH-trate] in	
water. Its chemical formula is C <sub>6</sub> H <sub>8</sub> O <sub>7</sub> [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.	

#### **Question #20: Literature – World Literature**

This title character is first encountered in the Scythian wild,	<b>Prometheus</b>
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.	



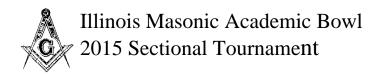
## **Question #21: Fine Arts – Art History**

10 points per part

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

## **Question #22: Fine Arts – Art History**

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



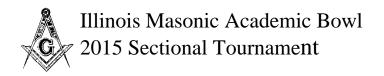
## **Question #23: Science – Chemistry**

10 points per part

	ese depictions typically show pressure on the y-axis and perature on the x-axis.	
1	Name these pictures that have solid, liquid, and gas sections that all meet at the triple point.	<pre>phase diagrams [prompt partial answer]</pre>
2	On a phase diagram, the border of the curve between the liquid and gas phases ends at this point.	<u>critical</u> 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**

Thi	s term can refer to hydrocarbons that have no double	
bor	nds.	
	Give this term that often refers to solutions that contain	saturated [accept word forms]
1	as much solute [SAHL-yoot] as they can.	
		• • • • • • • • •
	If a solute does not dissolve in a solution, this is the	<b>precipitate</b> [or <b>precipitation</b> , do
2	name for the solid that forms, typically at the bottom of	not accept "precipitant"]
	the solution.	
	Almost all salts with this cation [KAT-eye-on] are	ammonium [or NH <sub>4</sub> <sup>+</sup> ]
	soluble even though this cation does not contain any	
3	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.	



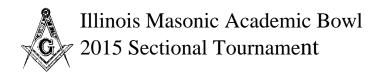
## **Question #25: Social Studies – U.S. History**

10 points per part

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

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

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



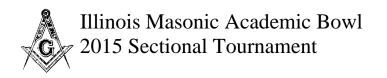
## **Question #27: Math – Geometry**

10 points per part

	risider a diagram on which Point C is between Points A 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?	<u>60</u> degrees

## **Question #28: Math – Geometry**

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



# Round # 1 5<sup>th</sup> Section Toss-up Questions

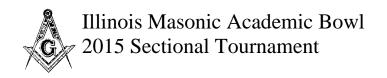
## **Question #29: Science – Physics**

10 points

The law adding the electric and magnetic values for this	net <b>force</b>	
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.		

#### **Question #30: Literature – U.S. Literature**

In this novel, a missionary undergoes facial scarring in	The <u>Color Purple</u>
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.	



#### Round # 1 5<sup>th</sup> Section Toss-up Questions

#### **Question #31: Math – Math Concepts**

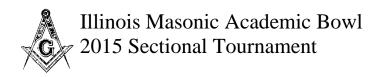
10 points

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.

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

## **Question #32: Social Studies – World History**

Rebel leaders supporting the independence of this kingdom	Scotland	
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.		



## Round # 1 Extra Section Toss-up Questions

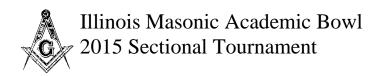
## Extra Question #1: Fine Arts – Art History

10 points

This city's Basilica Cistern [SIS-tern] is a catacomb that has	<u>Istanbul</u> , Turkey
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.	

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

An uprising in this territory was the subject of the differing	<u>Hawaii</u>
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.	



# Round # 1 Extra Section Toss-up Questions

#### Extra Question #3: Science – Astronomy

10 points

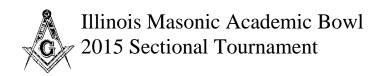
A 2014 study by NASA and ESA found that the nitrogen in	Opik-Oort Cloud
Titan's atmosphere matched the nitrogen in this location,	
supporting that this is where Titan was created. The inner	
part of this location is shaped like a disc and called Hills	
Cloud. This shell is located thousands of astronomical 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.	

#### Extra Question #4: Literature – British Literature

10 points

While swimming, this character offended a mouse by	Alice [accept
asking "where is my cat" in French. After consuming a	in Wonderla
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.	

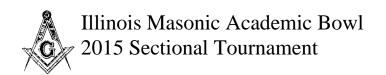
## Alice [accept Alice's Adventures in Wonderland]



# Round # 1 Extra Section Toss-up Questions

## Extra Question #5: Mathematics – Math Concepts

This value is the order of the Klein group, which is the	<u>four</u>
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.	



## Round # 1 Extra Section Teamwork Questions

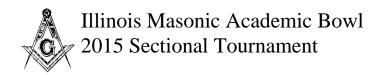
#### Extra Question #6: Literature – British Literature

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		
ard	ent for some desperate glory."	
	Name this war poem that describes the dropping of	"Dulce et Decorum est"
1	Five-Nines, and the immediate impact on a group of	
	soldiers "knock-kneed, coughing like hags."	
	This poet of "Dulce et Decorum Est" described the	Wilfred Owen
2	monstrous anger of the guns replacing passing-bells for	
4	those who die as cattle in "Anthem for Doomed	
	Youth."	
	Wilfred Owen was among the "War Poets" who fought	World War I [accept Great War]
	in this major conflict, along with Siegfried Sassoon and	
3	Rupert Brooke. Ernest Hemingway and E.E.	
	Cummings both volunteered as ambulance drivers	
	during this conflict.	

#### Extra Question #7: Literature - British Literature

	narrator of this poem proclaims "beauty is truth, truth uty."	
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."	"Ode on a Grecian Urn"
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>



## Round # 1 Extra Section Teamwork Questions

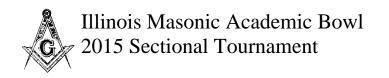
## Extra Question #8: Math – Algebra

10 points per part

	s concept is often represented by a lemniscate EM-nuh-scate].	
1	Name this concept often confused for a number. This concept represents the ability of some quantities to grow without bound.	infinity [or infinite]
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

The	ere 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 Goldbach [or Goldbach '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]



#### Round # 2 1<sup>st</sup> Section Toss-up Questions

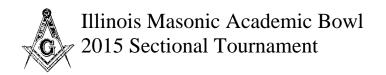
## **Question #1: Science – Biology**

10 points

This man may have stolen one of his discoveries from Jean	Louis <b>Pasteur</b>
[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.	

## **Question #2: Literature – Mythology**

The mother of this god was the eldest of the Pleiades	Hermes [accept Mercury]
[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.	



#### Round # 2 1<sup>st</sup> Section Toss-up Questions

#### **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.

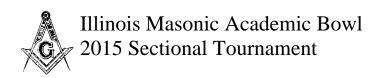
**Scopes** Monkey Trial [accept *State of Tennessee v. Scopes*]

#### **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]



#### Round # 2 1<sup>st</sup> Section Toss-up Questions

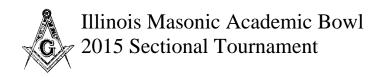
## **Question #5: Science – Astronomy**

1<u>0 points</u>

In 1992, the Ulysses [yoo-LIS-sees] spacecraft did a flyby	<u>Jupiter</u>
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.	
•	

#### **Question #6: Literature – British Literature**

This person wrote a story in which Sabrina was summoned	John <u>Milton</u>
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 <i>Comus</i> 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."	



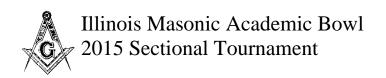
## Question #7: Math - Probability

10 points per part

An	swer 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.	independent [accept word forms such as independence, 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 0 <u>.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 0 <u>.305 repeating</u> ]

#### Question #8: Math - Probability

curi	e pair of events with this relationship is the event rently snowing outside and the event currently hot side.	, , ,
1	Give this two-word phrase that describes pairs of events that cannot both happen in the same experiment.	mutually exclusive
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?	0 <u>.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?	0 <u>.5</u> [or <u>one-half</u> ]



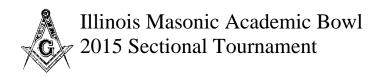
## **Question #9: Social Studies – Psychology**

10 points per part

Thi	s experiment was designed to get around the flaws of	
Mu	zafer Sherif's [MOO-zah-fer SHAH-reef's] autokinetic	
[aw	-toe-kih-NEH-tik] experiment.	
	Identify this experiment named for a psychologist in	<b>Asch</b> Experiment [accept mentions
1	which a number of participants at Swarthmore College	of <b>conform</b> ity, but do not mention
1	intentionally gave the wrong answer to a question	it]
	involving the lengths of lines.	
	The experiments of Sherif and Asch were meant to test	<b>conform</b> ity [accept word forms]
2	this tendency to go along with a group's belief or	
	behavior, even when it is clearly wrong.	
	Solomon Asch was also a pioneer of this German school	Gestalt
	of psychology in the United States. Holding that the	
3	whole is more than merely the sum of its parts, it can be	
	broken down into principles of proximity, similarity,	
	and continuity.	

#### **Question #10: Social Studies – Psychology**

	e opponent-process theory involving this sense breaks wn elements into three opposing pairs.	
1	The trichromatic theory of this sense instead identifies three specific wavelengths by which all colors are made.	vision [accept sight or other equivalents]
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.	flag of the United States [prompt on partial answers]
3	People with this condition are able to combine senses in unique ways, such as "seeing colors" or "tasting sounds."	synesthesia [si-nuhs-THEE-shuh]



## **Question #11: Science – Physics**

10 points per part

	s value can be calculated by multiplying half of mass es the square of speed.	
1	Name this energy of motion.	kinetic 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.	Bernoulli'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>Hamilton</u> ian

## **Question #12: Science – Physics**

	swer the following about objects that spin or move in eles.	
1	This is the name of the inward acceleration of an object that moves in uniform circular motion.	centripetal 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 momentum [accept mass times velocity or equivalents, but do not accept "mass" or "velocity" individually]

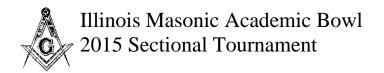
#### **Question #13: Literature – World Literature**

10 points per part

	s playwright was the first to extensively use the abasis [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].	Aristophanes
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].	The <u>Clouds</u> [accept <u>Nephelai</u> ]
3	This philosopher cited Aristophanes' caricature in his <i>Apology</i> .	<u>Plato</u>

#### **Question #14: Literature – World Literature**

	er death, he made his home in the Groves of ssedness.	
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.	Anchises [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.	Aeneas [ay-NEE-us]
3	Aeneas was the hero of the <i>Aeneid</i> , written by this Roman.	Publius <u>Virgil</u> ius Maro



#### Round # 2 3<sup>rd</sup> Section Toss-up Questions

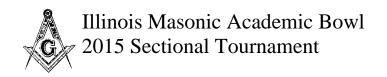
## **Question #15: Fine Arts – Art History**

10 points

Yves Klein created one shade of this color for his paintings.	<u>blue</u>
Jonathan Buttall was painted wearing a coat of this color.	
The guitar is the only item not painted this color in <i>The Old</i>	
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.	

#### **Question #16: Social Studies – Economics**

Welfare loss occurs when this value is set above the market-	price [accept cost]	
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.		



#### Round # 2 3<sup>rd</sup> Section Toss-up Questions

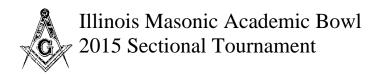
## **Question #17: Science – Chemistry**

10 points

These chemicals are classified as high temperature shifts or	catalysts [do not accept "enzyme"]
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.	

#### **Question #18: Literature – U.S. Literature**

Inspired by the sinking of the SS <i>Commodore</i> , this author	Stephen Crane
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 <i>The Red Badge of</i>	
Courage.	



#### Round # 2 3<sup>rd</sup> Section Toss-up Questions

## **Question #19: Math – Math Concepts**

10 points

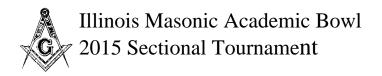
The Wilcoxon signed-rank test determines whether a	<u>median</u>
hypothesized value for this quantity is accurate. The	
cumulative distribution function at this value for a given	
distribution equals one-half. This value is represented by a	
segment drawn in the middle of a box-and-whisker plot. If	
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.	
• •	

## **Question #20: Social Studies – World History**

10 points

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.

## Elizabeth I of England [prompt on Elizabeth]



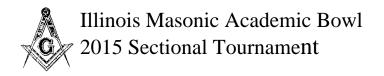
## Question #21: Fine Arts - Classical/Opera

10 points per part

In t	his ballet, Odile [oe-deel] is magically disguised by her	
fath	er Von Rothbart to look like Odette, who has been cursed	
to t	ake the form of a bird.	
	Name this tragic ballet about Prince Siegfried's failed	<u>Swan Lake</u>
1	attempt to break the spell on Odette.	
	This composer of Swan Lake also composed the	Peter Ilyich <u>Tchaikovsky</u>
2	ballets The Sleeping Beauty and The Nutcracker.	[chie-KOF-skee]
	Swan Lake's first act includes one of these dances in	<u>waltz</u>
3	three four time being held at Prince Siegfried's	
3	birthday. Tchaikovsky wrote one for the snowflakes in	
	The Nutcracker.	

## **Question #22: Fine Arts – Classical/Opera**

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



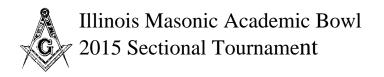
## Question #23: Math - Algebra

10 points per part

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

## Question #24: Math – Algebra

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



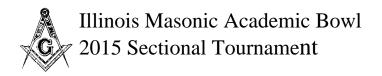
## **Question #25: Social Studies – World History**

10 points per part

	nominal ruler was the last Ching emperor Puyi, who was ught out of retirement for the purpose of ruling this state.	
1	Name this state whose invasion was preceded by the Mukden [mook-den] Incident.	Manchukuo [man-choo-kwoe] [or Manchuria]
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.	Russia [do not accept Soviet Union]

### **Question #26: Social Studies – World History**

The	e second of these conflicts is sometimes named for the	
Arr	ow, a ship which was allegedly involved in piracy and	
smı	ıggling.	
	Name these conflicts which saw China forced to open	<b>Opium</b> Wars
1	its economy to Western powers, as well as the	
	legalization of the trade of a particular plant.	
	The treaty to end the First Opium War was signed in	Nanking [accept Nanjing]
2	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.	
	The Treaty of Tianjin, which ended the Second Opium	Beijing [accept Peking]
3	War, opened up this city to foreign diplomats. Upon	
	the establishment of the People's Republic of China, it	
	was tapped as the capital.	



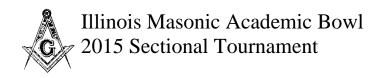
#### **Question #27: Literature – British Literature**

10 points per part

	used his son Linton to gain control of Thrushcross ange, 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.	Wuthering Heights
3	This author of <i>Wuthering Heights</i> described "ten thousand mingled rays of suns that know no winter days" in "To Imagination."	Emily Brontë [or Ellis Bell, prompt on Brontë or Bell]

#### **Question #28: Literature – British Literature**

		ro pointo poi part
	er being captured, he contemplates numerous cumstances 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.	Winston Smith [accept either]
2	Winston Smith was arrested for thought-crime in this dystopian novel.	Nineteen Eighty-Four
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> ]



#### Round # 2 5<sup>th</sup> Section Toss-up Questions

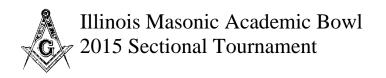
## **Question #29: Science – Physics**

10 points

Henry Kater made a reversible version of this device to	<b>pendulum</b> s
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.	

#### **Question #30: Literature – World Literature**

Almost committing suicide on the eve of Easter, this	Heinrich Faust
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].	



## Round # 2 5<sup>th</sup> Section Toss-up Questions

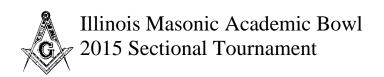
## **Question #31: Math – Math Concepts**

10 points

This solid is covered by a triple integral in which x goes	right circular <b>cylinder</b>
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.	
•	

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

This president's Executive Order 9981 abolished racial	Harry S Truman	
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.		



# Round # 2 Extra Section Toss-up Questions

#### 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.

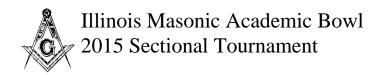
pituitary gland [or hypophysis or anterior pituitary]

#### 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 <u>Veil</u> [accept equivalents, as the question asks for the object, not the title]



# Round # 2 Extra Section Toss-up Questions

#### Extra Question #3: Math – Math Concepts

10 points

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 Erdös-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.

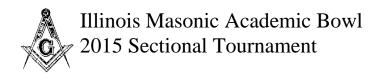
<u>triangle</u>s [accept more specific answers]

## Extra Question #4: Fine Arts – Classical/Opera

10 points

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 *English* and *French Suites* composed as educational material his two-part inventions and 3-part sinfonias. Name this Baroque composer of *The Goldberg Variations* and *The Well-Tempered Clavier*.

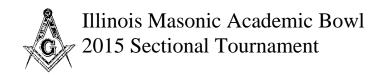
Johann Sebastian Bach



# Round # 2 Extra Section Toss-up Questions

## Extra Question #5: Social Studies – World History

Emily Hobhouse spoke out against the utilization of	Second Anglo-Boer War
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.	



# Round # 2 Extra Section Teamwork Questions

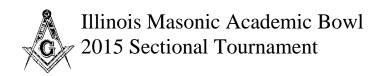
## Extra Question #6: Social Studies - U.S. History

10 points per part

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

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

	his doctrine, any country could request foreign aid if it 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.	North Atlantic Treaty Organization [accept NATO]



# Round # 2 Extra Section Teamwork Questions

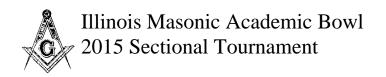
## Extra Question #8: Science - Chemistry

10 points per part

The	ese elements have very low reactivity.	
	Give the nickname that applies to Group 18 elements,	noble gases
1	which make up the rightmost column of the periodic table.	hobic 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.	radon
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

	s process drives reactions by attracting different ions to 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.	sulfate [or SO <sub>4</sub> <sup>2-</sup> ]



## Round # 3 1<sup>st</sup> Section Toss-up Questions

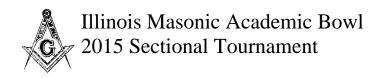
## **Question #1: Social Studies – U.S. Government**

10 points

This action taken against William Blount set the precedent	impeachment [accept word forms]
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.	

## **Question #2: Miscellaneous – Agriculture**

This is the common name for species of the Triticum	wheat
[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.	



## Round # 3 1<sup>st</sup> Section Toss-up Questions

#### **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.

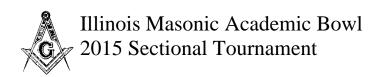
surface tension [prompt on
tension]

#### **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



## Round # 3 1<sup>st</sup> Section Toss-up Questions

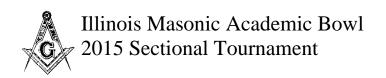
# **Question #5: Social Studies – World History**

10 points

This location's constitution called for five annually-elected	<b>Sparta</b> [accept <b>Lacedaemon</b> ]
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.	
-	

# **Question #6: Science – Astronomy**

Scientists are trying to determine whether ultraluminous	black holes
[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.	



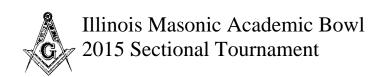
## **Question #7: Math – Geometry**

10 points per part

_	gular versions of this polygon have internal angles that asure 135 degrees.	
1	Name these polygons also known as eight-gons.	<u>octagon</u> s
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.	convex
3	How many diagonals does a convex octagon have?	<u>20</u>

## **Question #8: Math – Geometry**

	en two of these segments intersect, the power of a point be used to calculate the lengths of their parts.	
1	Name these segments whose endpoints are on a circle.	<u>chord</u> s
2	This is the longest chord in a given circle.	<u>diameter</u> s
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.	<b><u>6</u></b> units



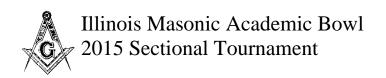
#### **Question #9: Fine Arts – Musical Theater**

10 points per part

	s musical opens with an auction where a chandelier that s 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.	The <b>Phantom of the Opera</b>
2	The Phantom of the Opera was composed by this musical theater writer, who also composed its sequel Love Never Dies, along with the musicals Cats and Evita.	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**

	s musical's film version opens with the declaration that he 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."	The Sound of Music
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]



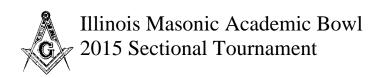
# **Question #11: Science – Biology**

10 points per part

	eles [uh-LEELS] with this type of trait are symbolized by apital 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.	Punnett square
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.	Huntington's disease [or Huntington's chorea]

# **Question #12: Science – Biology**

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



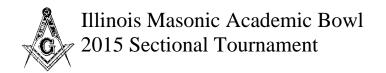
## **Question #13: Literature – Mythology**

10 points per part

	s Lydian [LIH-dee-un] weaver paid a price for traying 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].	Arachne [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.	Athena [accept Minerva]
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.	Poseidon [accept Neptune]

## **Question #14: Literature – Mythology**

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



## Round # 3 3<sup>rd</sup> Section Toss-up Questions

## **Question #15: Math – Math Concepts**

10 points

Three of these objects named for Euler [OY-ler] are used to	angles
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.	

# **Question #16: Fine Arts – Art History**

This person drew a weeping image of the pregnant Clasina	Vincent van Gogh
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.	

## Round # 3 3<sup>rd</sup> Section Toss-up Questions

#### **Question #17: Literature – World Literature**

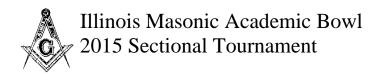
10 points

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 <u>Metamorphosis</u> [accept Die <u>Verwandlung</u>]

## **Question #18: Science – Physics**

The type of welding named for this phenomenon uses two	<u>friction</u>	
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.		



## Round # 3 3<sup>rd</sup> Section Toss-up Questions

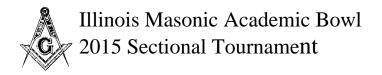
## **Question #19: Social Studies – U.S. History**

10 points

With Silas Deane and Arthur Lee, this person negotiated the	Benjamin Franklin	
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 New England Courant,		
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.		

#### **Question #20: Literature – British Literature**

This person wrote about a ring that would summon Azrael	Rudyard <u>Kipling</u>
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."	



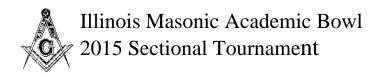
## **Question #21: Science – Chemistry**

10 points per part

	en this value is less than 7, a solution is considered lic [uh-SIH-dik].	
1	Name this value calculated by taking the opposite of a common log of a concentration.	<u>pH</u>
2	The pH [pee aitch] is a measure of how much of this ion with chemical formula $H_3O^+$ [aitch three oe plus] is in a solution.	<u>hydronium</u> [or <u>hydroxonium</u> ]
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**

Thi	s 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	oxygen [prompt on O]
4	element with atomic mass number sixteen.	
	This law states that the mole fraction of a gas dissolved	<u><b>Henry</b></u> 's law
3	in a liquid varies directly with the partial pressure of	
	the gas over the liquid.	



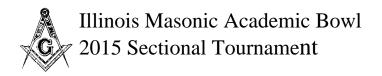
## **Question #23: Social Studies – U.S. History**

10 points per part

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

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

	spite the territory gain of the Gadsden Purchase, the ond 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.	Transcontinental Railroad
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.	Promontory Point [or Promontory 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.	Credit Mobilier



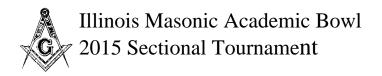
#### **Question #25: Math - Pre-Calculus**

10 points per part

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

#### **Question #26: Math - Pre-Calculus**

	s type of graphing system is often used for cardioids AHR-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.	<u>polar</u> coordinates
2	This name is given to the fixed point, which plays a role similar to the origin in rectangular coordinates.	<u>pole</u>
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]



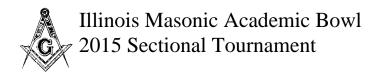
## **Question #27: Literature – British Literature**

10 points per part

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

#### **Question #28: Literature – British Literature**

		10 pointe por part
	s burgess [BUR-jis] was later tapped to serve as a judge 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 <u>Thomas</u> a Becket [prompt on <u>Becket</u> ]
3	This author fictionalized himself as the teller of the tales of Sir Thopas and Melibee in <i>The Canterbury Tales</i> .	Geoffrey Chaucer



## Round # 3 5<sup>th</sup> Section Toss-up Questions

## **Question #29: Science – Biology**

10 points

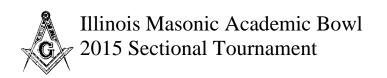
The formation of scar tissue in this organ can be called	<u>uterus</u>	
Asherman syndrome. The two outer layers around this organ		
are the myometrium [mie-oe-MEE-tree-um] and		
perimetrium [per-uh-MEE-tree-um]. This organ is the site of		
endometrial cancer, and it contains a functional layer that		
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.		

## **Question #30: Social Studies – World History**

10 points

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.

<u>Jerusalem</u> [accept <u>Yerushalayim</u>, <u>Bayt al-Muqaddas</u> or al-<u>Quds</u>]



## Round # 3 5<sup>th</sup> Section Toss-up Questions

## Question #31: Literature - U.S. Literature

10 points

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.

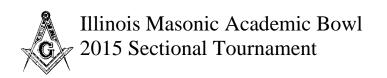
Moby-Dick [prompt on the White "Whale"]

## **Question #32: Math – Math Concepts**

10 points

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.

**polynomial**s [prompt on "power series"]



# Round # 3 Extra Section Toss-up Questions

#### Extra Question #1: Literature – World Literature

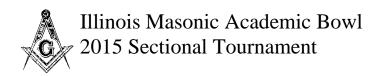
10 points

Acting against nature is considered violence in this poem, in	<u>Infer</u>
which nature is called "the grandchild of God." In this	Come
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].	

<u>Inferno</u> [prompt on *The <u>Divine</u>* <u>Comedy</u>]

#### Extra Question #2: Science - Health

People allergic to this food are also usually allergic to birch	apples
	apples
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.	
·	



# Round # 3 Extra Section Toss-up Questions

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

10 points

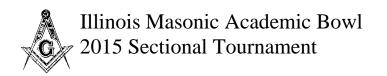
This person composed a Hebrew setting of biblical poems in
his Chichester Psalms. His MASS prompted surveillance from
Nixon's administration. His three symphonies are nicknamed
"Jeremiah," "The Age of Anxiety," and "Kaddish." He
conducted a performance of Beethoven's Ninth symphony that
replaced the 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 <u>Bernstein</u> [or Louis <u>Bernstein</u>]

#### Extra Question #4: Math – Math Concepts

10 points

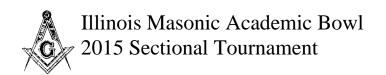
The fact that the eversion of these shapes is possible was proven by Stephen Smale. One construct in this shape can map to the complex plane plus a point at infinity. The Kepler problem asks how little space can be taken up by a set of these shapes, which is also known as their packing. This shape can 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.



# Round # 3 Extra Section Toss-up Questions

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

This state was the subject of the Willey Amendment, which	West Virginia
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.	



# Round # 3 Extra Section Teamwork Questions

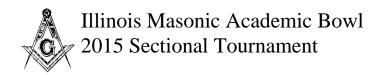
## Extra Question #6: Math – Trigonometry

10 points per part

Ang	gles in this quadrant are acute angles.	
1	In which quadrant are both the sine and cosine functions positive?	<u>1</u> [or <u>1<sup>st</sup></u> ]
2	If an angle in the first quadrant has a sine of 3/5, what is its cosine?	<u>4/5</u> [or 0 <u>.8</u> ]
3	Find the cotangent of that same angle.	<u>4/3</u> [or <u>1 1/3</u> or <u>1.3 repeating</u> ]

## Extra Question #7: Math – Trigonometry

opp	osite to an angle divided by the side length of a leg	
adj	acent to an angle.	
1	Name this function represented as y divided by x for a point on the unit circle.	<u>tan</u> gent
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><b>pi</b></u> radians



# Round # 3 Extra Section Teamwork Questions

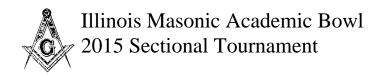
# Extra Question #8: Social Studies – World History

10 points per part

	ne important people have ended up with their heads ler water.	
1	The Lombard League was victorious over this "redbearded" 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.	Frederick I [accept Frederick Barbarossa, prompt on Frederick]
2	This "holy man" and confident of czarina Alexandra was poisoned with cyanide, then shot and beaten, before being bound and thrown into a river.	Grigory Efimovich Rasputin
3	According to Herodotus, this "great" Persian king and father of Cambyses [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

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



## Round # 4 1<sup>st</sup> Section Toss-up Questions

#### **Question #1: Social Studies – World History**

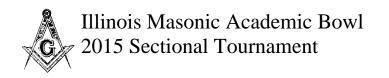
10 points

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.

Saddam <u>**Hussein**</u> Abd al-Majid al-Tikriti

## **Question #2: Science – Biology**

One example of these compounds was discovered in 2002 in	<b>amino acid</b> s
a methanosarcina [MEH-thuh-noe-sahr-SEE-nah] organism.	
One of these compounds is changed into melatonin	
[meh-luh-TOE-nin] by a four-step process, and 29 of these	
compounds are combined to form glucagon	
[GLOO-kah-gon]. These compounds contain a carboxylic	
[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.	



## Round # 4 1<sup>st</sup> Section Toss-up Questions

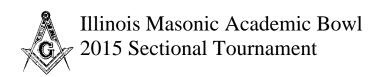
## **Question #3: Miscellaneous – Industrial Arts**

10 points

Processing this substance involves mastication inside a	<u>rubber</u> [prompt on <u>latex</u> ]
Banbury chamber. Most of the material used in its natural	
form is sourced from <i>Hevea brasiliensis</i> [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.	

# **Question #4: Math – Math Concepts**

In the napkin ring problem, this quantity does not depend	<u>volume</u>	
upon the size of the sphere. This quantity is surprisingly		
finite for Gabriel's horn. For a parallelepiped		
[pa-ruh-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.		



## Round # 4 1<sup>st</sup> Section Toss-up Questions

#### **Question #5: Literature – British Literature**

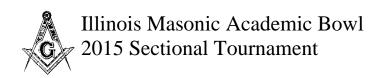
10 points

This person wrote a play in which Trotter pretended to be a	Agatha <u>Christie</u>
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 Murder on the Orient	
Express.	

#### **Question #6: Science – Earth Science**

10 points

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.



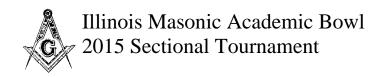
## **Question #7: Social Studies - Current Events**

10 points per part

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

#### **Question #8: Social Studies – Current Events**

	November 2014, President Obama went to this country ign 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 McConnell



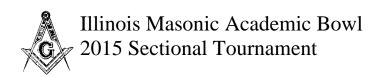
## **Question #9: Science – Physics**

10 points per part

	chemistry, a change in this condition is covered by Lentelier'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.	<u>stable</u> 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**

	s constant equals the ratio between energy and frequency ording to explanations of the photoelectric effect.	
1	Name this constant represented by a lower case h.	<u>Planck</u> '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



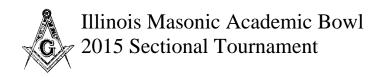
#### **Question #11: Literature – World Literature**

10 points per part

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

#### **Question #12: Literature – World Literature**

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



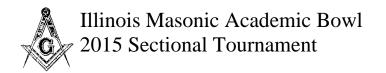
## **Question #13: Math – Trigonometry**

10 points per part

	s type of symmetry is exhibited by functions whose ohs 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.	cos ine and sec ant [either order]
3	Find the secant of negative sixty degrees.	2

## **Question #14: Mathematics – Trigonometry**

Thi	s 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.	periodic functions
2	Horizontal shifts of periodic functions are known as these types of shifts.	<pre>phase shifts [or phase offset or phase difference]</pre>
3	Find the phase shift for the function f of x equals the sine of the quantity four x minus three.	3/4 [or 0.75, accept an additional description of positive or to the right, do not accept negative or to the left]



## Round # 4 3<sup>rd</sup> Section Toss-up Questions

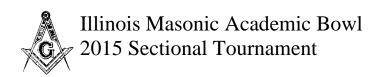
## **Question #15: Social Studies – Geography**

10 points

In Chapter 10 of his book, Daniel had a vision by this river,	<u>Tigris</u> 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.	

## **Question #16: Fine Arts – Classical/Opera**

Charles Hanon wrote 60 exercises for this instrument, and	<u>piano</u> forte
Carl Czerny wrote etudes [eh-toods] for it in <i>The School of</i>	
Velocity. Robert Schumann's Kreisleriana	
[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.	



## Round # 4 3<sup>rd</sup> Section Toss-up Questions

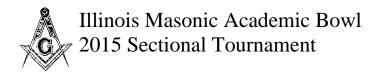
#### **Question #17: Literature – World Literature**

10 points

This person wrote about a woman who provided a pistol to a	Henrik Johan <u><b>Ibsen</b></u>
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 An Enemy of the People. The	
creator of Nora Helmer and Hedda Gabler, name this author	
of A Doll's House, a Norwegian playwright.	

# **Question #18: Science – Chemistry**

Though it is made of lead sulfide, galena is often found	silver	
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].		
-		



## Round # 4 3<sup>rd</sup> Section Toss-up Questions

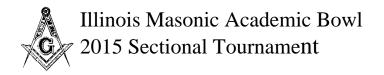
## **Question #19: Social Studies – U.S. History**

10 points

This politician used the slogan "the full dinner pail" during	William McKinley	
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.		

## **Question #20: Literature – Mythology**

In the court of Lycomedes [lie-koe-MEE-dees], this	<u>Achilles</u>
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.	



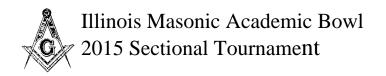
## Question #21: Math – Algebra

10 points per part

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

## Question #22: Math – Algebra

of x	asider the graph of the equation y equals the square root	
1	What is the name of the shape formed by the graph? The graph only forms half of this shape.	parabola [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 0 <u>.25</u> ]
3	Find the slope of the tangent line to the graph at x equals sixteen.	<u>1/8</u> [or 0 <u>.125</u> ]



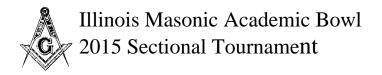
## **Question #23: Social Studies – U.S. History**

10 points per part

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

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

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



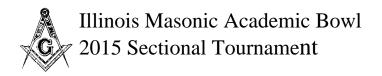
## **Question #25: Fine Arts – Art History**

10 points per part

		i o pointe poi paire
a	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	
U	p hat.	
	Name this painting of people enjoying a day off at an	A Sunday Afternoon on the
	island in the Seine.	Island of La Grande Jatte, 1884
		[or Un dimanche après-midi à
_	·	<u>l'Île de la Grande Jatte</u> , 1884 or A
		Sunday on La Grande Jatte;
		accept Isle in place of Island]
	A Sunday Afternoon on the Island of La Grande Jatte	<b>pointillism</b> [accept word forms]
4	was painted using this technique, where a number of	
	tiny dots of color are combined to create an image.	
	This pioneering pointillist painted A Sunday Afternoon	Georges <u>Seurat</u>
	on the Island of La Grande Jatte.	

## **Question #26: Fine Arts – Art History**

	air of altarpieces for the Cathedral of Our Lady in werp show this man before and after his death.	
1	Name this man who is shown being elevated, then descending from the cross.	Jesus Christ (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 <b>Rubens</b>
3	Rubens painted the ceiling of the Banqueting House at Whitehall in this English city, where Westminster Palace can be found.	London



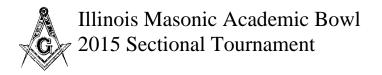
## **Question #27: Literature – British Literature**

10 points per part

	er conquering Poland, this character encounters a scene 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.	<u>Hamlet</u>
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**

	e reader first encounters this character in a countinguise, 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 <u>Machiavelli</u>



### Round # 4 5<sup>th</sup> Section Toss-up Questions

#### 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.

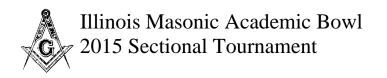
electric **current** [prompt on **I**]

#### **Question #30: Social Studies – World History**

10 points

Ranulf de Blondeville 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]



#### Round # 4 5<sup>th</sup> Section Toss-up Questions

#### **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

## Round #4 **Extra Section Toss-up Questions**

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

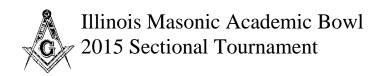
10 points

The losing side at this battle was delayed by the funeral of As a 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

This number is equal to half the Wallis product, which is	<u>pi</u>
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.	
Tr · · · · · · · · · · · · · · · · · · ·	



## Round # 4 Extra Section Toss-up Questions

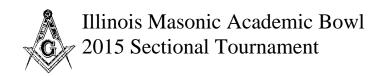
## Extra Question #3: Fine Arts – Art History

10 points

One of these items shows a "Child with Toy Hand Grenade	<b>photo</b> graphs
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 Moon and Half Dome	
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.	

## Extra Question #4: Science – Physics

The maximum value of this quantity before damage occurs	<u>torque</u>
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.	



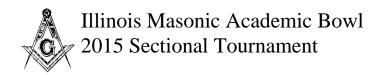
## Round # 4 Extra Section Toss-up Questions

#### 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 <u>Civil</u>
<u>Disobedience</u>" [accept "<u>Resistance</u>
to Civil Government"]



## Round # 4 Extra Section Teamwork Questions

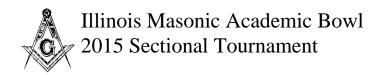
## Extra Question #6: Science – Biology

10 points per part

Thi	s 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.	lichen
3	Marmots, which are this type of rodent, are able to survive alpine tundra conditions.	squirrel [or sciuridae or xerinae]

## Extra Question #7: Science – Biology

	e allopatric type of this process occurs when the oulations are separated.	
1	Name this process during which population differences grow to the point at which they can no longer interbreed.	<pre>speciation [accept word forms or explanations involving the creation of a new species]</pre>
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>finch</u> es
3	Name the type of speciation that takes place with both populations living in the same region.	sympatric



## Round # 4 Extra Section Teamwork Questions

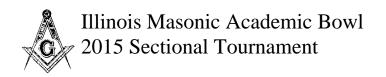
## Extra Question #8: Literature - U.S. Literature

10 points per part

	outting on a particular event by this man, one guest was I 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 Prospero
2	Prince Prospero hosted a masquerade ball for those seeking to evade the title affliction in this short story.	"The Masque of the Red Death"
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

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



#### Round # 5 1<sup>st</sup> Section Toss-up Questions

#### **Question #1: Literature – Mythology**

10 points

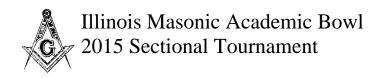
In the Valley of the Kings, this god is depicted as the ruler	Anubis
of nine bows. Aided in a primary role by his daughter	
Kebechet [KEB-chet], this "lord of the necropolis" was,	
before Osiris [oh-SIE-rus], referred to as the "Foremost of	
Westerners." His title of "He Who Counts the Hearts" stems	
from his role in the weighing of one's heart after death.	
Name this Egyptian guardian of the dead, a jackal-headed	
deity.	

#### **Question #2: Fine Arts – Composers of Modern Era**

10 points

One composer from this country wrote *Eight Songs For a Mad King*. 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 *Sea Interludes* are part of his opera *Peter Grimes*. This country is home to Peter Maxwell Davies and the composer of *A Simple Symphony* and *The Young Person's Guide to the Orchestra*. A work directly involving two composers from this country is *Fantasia on a Theme by Thomas Tallis*, which was composed by Ralph Vaughan Williams. Name this home of Royal Albert Hall and Covent Garden where George Frideric Handel composed *Music for the Royal Fireworks* for King George the Second.

Great <u>Britain</u> [or The <u>United</u> <u>Kingdom</u> of Great Britain and Northern Ireland or The <u>UK</u> or <u>England</u>]



## Round # 5 1<sup>st</sup> Section Toss-up Questions

#### Question #3: Science - Health

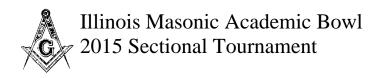
10 points

This device is helpful for patients with left bundle branch	artificial <b>pacemaker</b> s
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.	

## **Question #4: Social Studies – U.S. History**

10 points

## <u>Bay of Pigs</u> invasion [or Invasion de <u>Bahia de Cochinos</u>]



#### Round # 5 1<sup>st</sup> Section Toss-up Questions

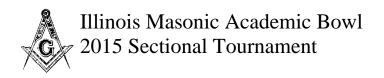
#### **Question #5: Literature – World Literature**

10 points

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 *Anna Karenina* and *War and Peace*.

## **Question #6: Science – Physics**

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,	Sir Isaac <u>Newton</u>	
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.		



## **Question #7: Fine Arts – Art History**

10 points per part

	ne these gods who were the subject of lost Greek lptures.	
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.	Apollo
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.	Zeus
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.	Antinous Mondragone

## **Question #8: Fine Arts – Art History**

	arcus Aurelius, Peter the Great, and Erasmo di Narni were picted riding one of these animals.	, ,
1	Name these animals included in equestrian statues.	<u>horse</u> s
2	This nickname of Erasmo di Narni is often used to title the equestrian sculpture portraying him by Donatello.	<u>Gattamelata</u>
3	Gattamelata 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 Gates of Paradise.	bronze

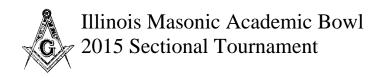
#### Question #9: Literature - U.S. Literature

10 points per part

Thi	s poem describes "painted womenluring 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."	"Chicago"
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 Sandburg
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**

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



## **Question #11: Science – Biology**

10 points per part

The	se features are found on angiosperms.	
1	Name these parts of plants important in reproduction that typically include colorful petals.	<u>flower</u> s
2	Pollen is germinated at this tip of the flower carpel which is connected to the ovary by the style.	stigma
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**

This structure includes the medulla oblongata

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

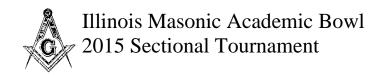
## **Question #13: Social Studies – World History**

10 points per part

	n Talbot and Thomas Scales oversaw much of the ification for the losing side at this battle.	
1011	incation for the losing side at this battle.	
	Name this attack where, after failing to break the	Siege of Orleans
1	opposing supply line at the Herrings, a diversion	
1	allowed a force from Chezy [cheh-zee] to supply the	
	beleaguered French residents.	
	This peasant girl allegedly heard voices that told her to	Saint <u>Joan</u> of Arc [accept <u>Jeanne</u>
2	rush to the aid of the dauphin Charles. She was later	d'Arc]
	captured, sold to the English, and burned at the stake.	
	Following on from Orleans, Joan's forces took a	<u>Reims</u>
3	number of cities, including this traditional coronation	
	city. After its capture, Charles VII was crowned here.	

## **Question #14: Social Studies – World History**

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



#### Round # 5 3<sup>rd</sup> Section Toss-up Questions

#### 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.

<u>negative</u> numbers [or <u>negatives</u> or <u>negation</u>]

#### **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.

<u>Jesus Christ</u> [prompt on "Messiah," accept <u>Jesus of</u> <u>Nazareth</u> or <u>Jesus of Galilee</u>]

### Round # 5 3<sup>rd</sup> Section Toss-up Questions

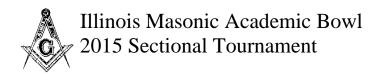
## **Question #17: Language Arts – Grammar/Usage**

10 points

No words of this part of speech are in the novel <i>The Train</i>	<u>verb</u>
from Nowhere by Michel Dansel. Avalent 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.	

## **Question #18: Science – Chemistry**

Some scientists claim that the forces named for this person	Johannes Diderik van der Waals
explains the Casimir effect. The surface or envelope named	[prompt on <u>Waals</u> ]
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.	



### Round # 5 3<sup>rd</sup> Section Toss-up Questions

#### **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.

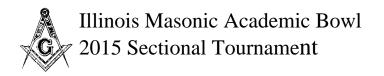
Andrew Johnson [prompt on Johnson]

#### 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.

<u>Fox News</u> Channel [accept <u>FNC</u>, prompt on <u>Fox</u>]



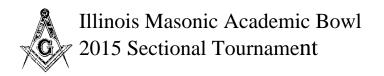
## **Question #21: Mathematics – Algebra**

10 points per part

The	eir 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>sequence</u> s
2	In this type of process, the value of a number in a sequence depends on previous values.	recursion [accept word forms such as recursive]
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?	3

## **Question #22: Mathematics – Algebra**

	reral ways to solve linear examples of these entities use crices.	
1	Name these combinations of equations or inequalities that are typically solved by finding points of intersection.	systems [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.	7 [if a y-coordinate is also given, it is -2/3]



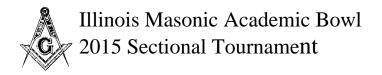
#### **Question #23: Social Studies – U.S. Government**

10 points per part

The	current iteration of this agency was created following	
the	Elixir Sulfanilamide [sul-fuh-NIL-uh-mide] disaster in	
193	7.	
	Name this federal body, which regulates tobacco	Food and Drug Administration
1	products and ensures proper labeling of cosmetics and supplements.	[accept FDA]
2	A key milestone in the creation of the FDA was this President's signing of the Pure Food and Drug Act.	Theodore Roosevelt
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.	The <b>Jungle</b>

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

	lawsuit that directly led to this Supreme Court case 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.	Roe v. Wade [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.	abortion
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.	Planned Parenthood Federation of America



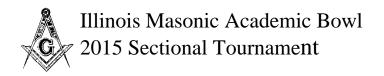
## **Question #25: Science – Physics**

10 points per part

	ne supernovas produce bursts of this type of radiation, 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.	gamma [accept longer answers]
2	One of the sources of gamma rays in space are these rotating neutron stars.	<u>pulsar</u> s
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**

	he War of the Currents, George Westinghouse favored type of current.	
1	Name this current that creates a sinusoidal graph when it is graphed versus time.	alternating current [or AC]
2	These devices represented by a coil of wire are used in many AC circuits. These devices are measured in henries.	<u>inductor</u> s
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> ]



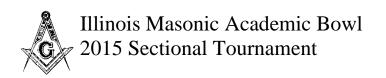
## **Question #27: Literature – Mythology**

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.	Thor
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.	goats

## **Question #28: Literature – Mythology**

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.	apples [prompt on fruit]
3	Thiazi was able to kidnap Idun thanks to his initial capture of this Norse trickster god.	<u>Loki</u>



#### Round # 5 5<sup>th</sup> Section Toss-up Questions

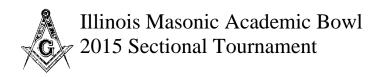
#### **Question #29: Social Studies – World History**

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 19<sup>th</sup> 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.

#### **Question #30: Math – Math Concepts**

Applications to this entity are explicitly denied in statements	empty set [or null set]	
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.		



## Round # 5 5<sup>th</sup> Section Toss-up Questions

## **Question #31: Science – Biology**

10 points

Research in 2007 indicated that a type of sea slug could	chlorophyll [accept more specific
manufacture this compound. The two most common types	answers]
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.	

## Question #32: Literature – U.S. Literature

The characters in this novel utilize seashells for listening to	Fahrenheit 451
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.	

## Round # 5 Extra Section Toss-up Questions

#### Extra Question #1: Social Studies – World History

10 points

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].

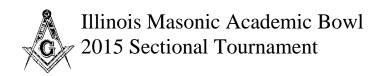
the <u>Red Baron</u> [accept Manfred von <u>Richthofen</u> before mention, accept The Red <u>Battleflyer</u>, Der <u>Rote Kampfflieger</u> or Le <u>Petit Rouge</u>]

#### Extra Question #2: Math – Math Concepts

10 points

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 *Elements*, a text which defined geometry for centuries.

#### **Euclid** [prompt on **Euclidean**]



## Round # 5 Extra Section Toss-up Questions

## Extra Question #3: Fine Arts - Classical/Opera

10 points

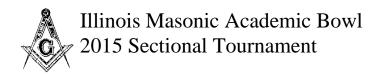
This composer's <i>Liebeslieder</i> [LEE-bes-lee-der] <i>Waltzes</i> for	Johannes <b>Brahms</b>
voices and piano ends with a Wiegenlied [VEE-gen-leed].	
His Saint Anthony Variations are based on a theme by	
Joseph Haydn [HIE-din]. He set texts by Goethe [GUR-tah]	
in his Alto Rhapsody, and a work composed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

#### Extra Question #4: Literature - British Literature

10 points

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.		

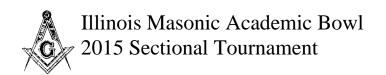
<u>Tarzan</u> of the Apes [accept John <u>Clayton</u>, prompt on "White-Skin"]



# Round # 5 Extra Section Toss-up Questions

## Extra Question #5: Science – Chemistry

A compound called hex contains six atoms of this element	fluorine [do not accept "fluoride"]
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.	



## Round # 5 Extra Section Teamwork Questions

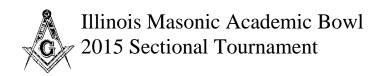
#### Extra Question #6: Literature – World Literature

10 points per part

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

## Extra Question #7: Literature - World Literature

		To points por part
	lowing the loss of the title object to an apparition, a minent personage reduced his use of the phrase "Do you	
1	ize who stands before you?" when dealing with	
	, c	
infe	eriors.	
1	The personage uttered that phrase to Akakiy Akakievitch [ah-KAH-kee ah-KAH-kyeh-vich] after a	"The <u>Overcoat</u> "
	certain item of clothing was stolen in this short story.	
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.	St. Petersburg [do not accept "Petrograd" or "Leningrad"]



## Round # 5 Extra Section Teamwork Questions

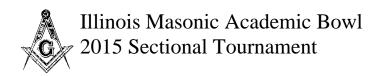
## Extra Question #8: Science - Chemistry

10 points per part

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

## Extra Question #9: Science - Chemistry

Ma	ny metal oxides have this property.	
1	Name these molecules that can act as both acids and bases.	<pre>amphoteric [or amphoterous or amphoterism, do not accept "amphiprotic"]</pre>
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.	surfactants [or surface-active agents]
3	Surfactant molecules join together to form these colloidal structures that usually are hydrophobic in their centers.	<u>micelle</u> s



### Round # 6 1<sup>st</sup> Section Toss-up Questions

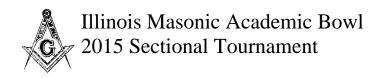
## **Question #1: Math – Math Concepts**

10 points

The super types of these shapes are Lamé [lah-MAY]	<u>ellipse</u>
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.	

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

The main character in this story regretted not wearing a	"To Build a Fire"
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.	



#### Round # 6 1<sup>st</sup> Section Toss-up Questions

#### **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.

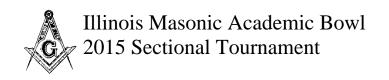
Chicago White Sox [prompt on Chicago or Sox or Black Sox]

#### **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



#### Round # 6 1<sup>st</sup> Section Toss-up Questions

#### Question #5: Literature - British Literature

10 points

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.

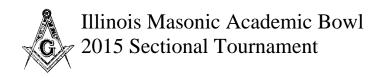
Oliver Twist: The Parish Boy's Progress

#### **Question #6: Social Studies – World History**

10 points

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 Hammarskjold [HAHM-ur-skyoeld], and Kofi Annan. Name this post whose current holder is Ban Ki-Moon.

<u>Secretary-General</u> of the United Nations [prompt on answers implying leadership of the United Nations or UN]



# **Question #7: Science – Physics**

10 points per part

Ide	ntify 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.	interference  diffraction [accent word forms]
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.	Huygens [HOY-gens] principle

## **Question #8: Science – Physics**

Nai	me 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 Kirchhoff'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.	BCS theory [or Bardeen Cooper Schrieffer]

## Question #9: Social Studies - Geography

10 points per part

Thi	s 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.	Snake 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**

	dinand de Lesseps headed the company that tried uccessfully to build this structure.	
1	Name this waterway that was under United States control prior to its transfer to its namesake Central	Panama Canal
1	American country, which was negotiated under President Jimmy Carter.	
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>

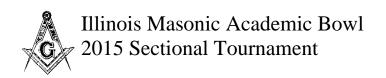
#### **Question #11: Literature – World Literature**

10 points per part

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

#### **Question #12: Literature – World Literature**

Thi	s poet's eponymous meter consists of four-line stanzas.	
1	Name this poet described as the "tenth muse" by Plato. Catullus' epithalamium [eh-pih-thah-LAY-mee-um] was inspired by one written by this native of Lesbos.	Sappho
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.	wedding [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."	Aphrodite [do not accept "Venus"]



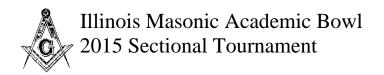
## **Question #13: Math – Probability**

10 points per part

	s operation on sample spaces is sometimes represented 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>intersect</u> ion
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?	0 <u>.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?	0 <u>.8</u> [or <u>four-fifths</u> ]

# **Question #14: Math – Probability**

	ese diagrams are used to organize probability problems 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 0 <u>.125</u> ]
3	If three coins are tossed, what is the probability that exactly one is heads?	<u>3/8</u> [or 0 <u>.375</u> ]



#### Round # 6 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Science – Astronomy**

10 points

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.

#### galaxy [or galaxies]

#### **Question #16: Fine Arts – Classical/Opera**

10 points

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 *La Bohème* [boe-hem] and *Madame Butterfly*.

Giacomo Antonio Domenico Michele Secondo Maria <u>Puccini</u>

## Round # 6 3<sup>rd</sup> Section Toss-up Questions

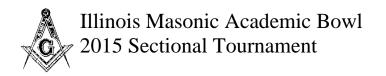
## **Question #17: Social Studies – U.S. History**

10 points

Applicants for jobs with this group had to be "skinny, wiry,	Pony Express
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.	

#### **Question #18: Literature – World Literature**

This author wrote a story in which the narrator wondered if	Jorge Luis <b>Borges</b>	
"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].		



## Round # 6 3<sup>rd</sup> Section Toss-up Questions

## **Question #19: Science – Chemistry**

10 points

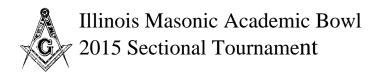
This person worked with Emile Zuckerkandl	Linus <b>Pauling</b>
[zoo-ker-KAHN-del] on hemoglobin studies that	
determined the rate of evolution, creating a molecular	
clock. His book titled The Nature of the Chemical Bond	
introduced the concept of hybridization. After this person	
with others worked 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.	

#### **Question #20: Social Studies – Economics**

10 points

By the Dodd-Frank Act, this organization utilizes stress	<b>Fed</b> eral
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.	

#### Federal Reserve System



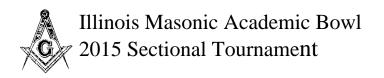
## **Question #21: Fine Arts – Art History**

10 points per part

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

## **Question #22: Fine Arts – Art History**

	s man painted a portrait of Anne of Cleves [kleevs] that s 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.	Henry VIII
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.	The French Ambassadors



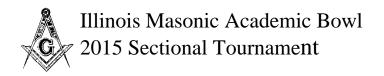
#### **Question #23: Literature – U.S. Literature**

10 points per part

	dra Finchley takes an interest in the protagonist of this el out of spite.	
1	Name this novel in which Clyde Griffiths engineers the death of the pregnant Roberta Alden.	An American Tragedy
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 <b>Dreiser</b>
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.	New York

#### **Question #24: Literature – U.S. Literature**

	tman's Cafe in Holcomb, Kansas is a hotbed of gossip rounding a gruesome murder in this book.	
1	Name this book in which one rumor implicated Taylor Jones in the murder of the Clutter family.	<u>In Cold Blood</u>
2	In Cold Blood was penned by this author. He wrote of the escapades of Holly Golightly in Breakfast at Tiffany's.	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.	Las Vegas, Nevada



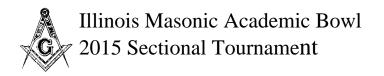
## **Question #25: Science – Chemistry**

10 points per part

	s type of bonding is common when nonmetallic elements 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**

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



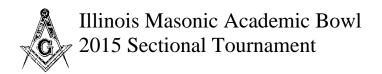
## Question #27: Social Studies – U.S. History

10 points per part

	s Representative cast the sole vote against the United tes entering World War II.	
1	Name this Montana Congresswoman who was also the first female elected to serve in the House.	Jeannette Pickering Rankin
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" La Follette [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 <b>LaGuardia</b>

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

	acceptance of a bribe from a soft drink giant led to his isive nickname of "Pepsi-Cola Kid."	
1	Name this Wisconsin senator whose oratory and mudslinging instigated the 1950s Red Scare.	Joseph McCarthy
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 <b>Rosenberg</b> s
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



## Round # 6 5<sup>th</sup> Section Toss-up Questions

#### **Question #29: Math – Math Concepts**

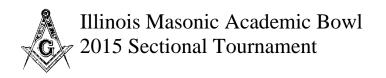
10 points

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.

<u>real</u> numbers [or <u>reals</u>, accept **continuum** before it is mentioned]

## **Question #30: Social Studies – World History**

This person was born in Nice [neese] and years later wished	Giuseppe Garibaldi	
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.		



## Round # 6 5<sup>th</sup> Section Toss-up Questions

#### **Question #31: Literature – British Literature**

10 points

One character in this novel dreams of a song that spoke of a	Animal Farm	
"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.		

# **Question #32: Science – Physics**

	- 1
An equation named for this person multiplies mobility times	Albert Einstein
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.	

# Round # 6 Extra Section Toss-up Questions

#### Extra Question #1: Literature – U.S. Literature

10 points

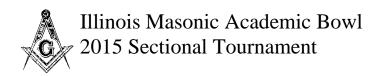
Spoon River [accept Spoon River Anthology]

#### 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.

<u>range</u> [or <u>image</u> or <u>codomain</u>, do not accept "domain"]



# Round # 6 Extra Section Toss-up Questions

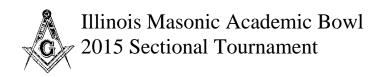
## Extra Question #3: Fine Arts – Art History

10 points

This man created a sculpture of a man's torso and legs that is	Auguste <b><u>Rodin</u></b>
named <i>The Walking Man</i> . 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 [DAHN-tay] sitting. Name this sculptor	
of The Gates of Hell, which inspired his works The Kiss and	
The Thinker.	

## Extra Question #4: Science – Physics

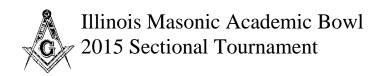
A balance named for this unit uses current and potential	Watt	
difference to measure mass. The measurement device		
named for this unit contains a potential coil and a pair of		
current coils. This unit equals a volt squared per ohm, and		
this unit also equals a volt ampere. This unit is named for		
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.		



# Round # 6 Extra Section Toss-up Questions

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

Samuel Mathews failed in his attempt to dissolve this	House of <b>Burgesses</b>
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.	



# Round # 6 Extra Section Teamwork Questions

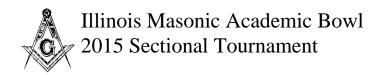
## Extra Question #6: Literature – U.S. Literature

10 points per part

	his novel, the youngest son of the central family, Dude, ries 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.	Tobacco Road
2	Tobacco Road was written by this author of God's Little Acre.	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

	e manuscript of her story was given to John Ray by the yer 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.	Alaska



# Round # 6 Extra Section Teamwork Questions

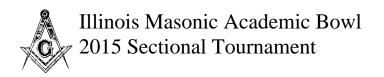
## Extra Question #8: Math – Geometry

10 points per part

	nsider a right triangle with side lengths of five, twelve, 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

Ans	swer the following questions about parallelograms.	
1	What type of linear transformation changes a rectangle into a parallelogram?	skew
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.	150 degrees



## Round # 7 1<sup>st</sup> Section Toss-up Questions

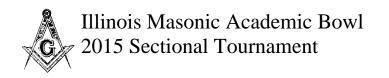
## Question #1: Social Studies - Religion

10 points

According to Hebrews Book 9 Verse 4, one of this person's	<u>Aaron</u>
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.	

## **Question #2: Science – Chemistry**

Though this compound does not contain sodium, it can be	methane [prompt on CH <sub>4</sub> ]
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.	



### Round # 7 1<sup>st</sup> Section Toss-up Questions

#### **Question #3: Language Arts – Grammar/Usage**

10 points

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.

personification [accept
anthropomorphism]

#### **Question #4: Social Studies – U.S. History**

10 points

The decision in *Harris v New York* established that this case's precedent could not be used to permit perjury. The majority opinion in this case was re-affirmed in *Dickerson v US*, which concerned a voluntary statement. This case utilized the precedent set in *Escobedo* 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.

Miranda v Arizona [prompt on Arizona]

### Round # 7 1<sup>st</sup> Section Toss-up Questions

#### **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.

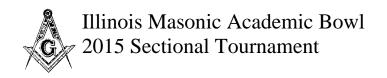
Global Positioning System [accept GPS]

#### **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 C<sub>8</sub>H<sub>10</sub>N<sub>4</sub>O<sub>2</sub> [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.

aff	ei	n	<u>e</u>
			_



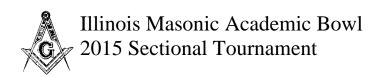
## Question #7: Math – Algebra

10 points per part

	ese functions are defined differently over different parts 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.	<pre>piecewise-defined functions [or hybrid functions]</pre>
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.	_
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.	interpolation [accept word forms]

## **Question #8: Math – Algebra**

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



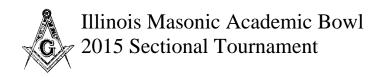
# **Question #9: Social Studies – World History**

10 points per part

	s former commander of his country's air force utilized sitive 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 Egypt
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.	Syria [accept Syrian Arab Republic]

#### **Question #10: Social Studies – World History**

	efforts at mediating the conflict in Bengal led to his assination 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>M</u> ohandas Karamchand "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 [DAHN-dee].	salt [accept Salt March]
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.	satyagraha [saht-yah-GRAH-hah]



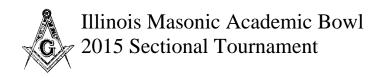
# **Question #11: Science – Chemistry**

10 points per part

Mo	st 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.	<u>lanthanide</u> s [or <u>lanthanoid</u> s]
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.	<u>f</u>
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**

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



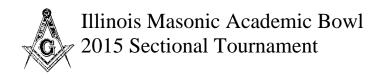
#### **Question #13: Fine Arts – Jazz**

10 points per part

	n Getz played this instrument on bossa nova recordings, luding "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	<u>sax</u> ophone
	this instrument include Wayne Shorter and Kenny G.	
	This saxophonist stopped performing his instrument at	John William Coltrane
2	the end of his track "Acknowledgement" to repeatedly	
	sing the phrase "A Love Supreme." His band also	
	released the album <i>Giant Steps</i> .	
	This Kansas Citian [SIH-teen-un] performed	Charlie "Bird" <b>Parker</b>
3	saxophone on the bebop songs "Ko-Ko" and "Yardbird	
	Suite," which is titled after his nickname.	

#### **Question #14: Fine Arts – Jazz**

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



## Round # 7 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Science – Physics**

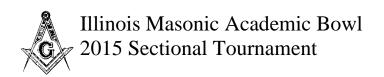
10 points

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.

weak nuclear interaction [or weak
nuclear force, prompt on
electroweak]

#### **Question #16: Literature – U.S. Literature**

This writer borrowed from Book Six of the <i>Metamorphoses</i>	Phillis Wheatley
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 Poems on Various Subjects,	
Religious and Moral. 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.	
-	



#### Round # 7 3<sup>rd</sup> Section Toss-up Questions

#### **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.

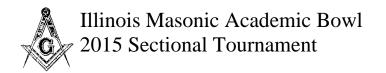
integral [accept word forms such
as integration and more specific
answers, prompt on
antiderivative, do not accept
"derivative"]

#### 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.

<u>Ten</u>th Amendment to the United States Constitution



## Round # 7 3<sup>rd</sup> Section Toss-up Questions

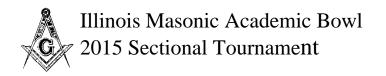
## **Question #19: Literature – Mythology**

10 points

The Meliae [MEH-lee-ay], a group of ash tree nymphs, were	<u>Uranus</u> [accept <u>Coelus</u> ]
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.	

## **Question #20: Fine Arts – Art History**

It appears that a cane is being used to support the title object	Salvador <u><b>Dali</b></u>
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 <i>The Persistence of Memory</i> .	



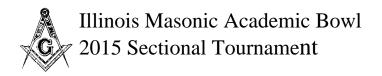
#### **Question #21: Social Studies – Economics**

10 points per part

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

#### **Question #22: Social Studies – Economics**

	, M2, and M3 money are delineated based on this racteristic.	
1	Name this characteristic that can be described as the ease with which money can be converted into a different medium of exchange.	<u>liquid</u> ity
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.	one-half [accept equivalents, do not accept forms of "doubling"]



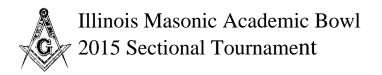
## Question #23: Science - Biology

10 points per part

Thi	s 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.	mRNA [or messenger RNA]
2	This is the process in which a message from DNA is coded onto messenger RNA while the messenger RNA is created.	transcription [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>spliceosome</u> s

## Question #24: Science - Biology

	s principle is named for the English mathematician and German obstetrician who developed it independently.	
1	Name this principle of genetic equilibrium under a given set of assumptions.	Hardy-Weinberg 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 bottleneck



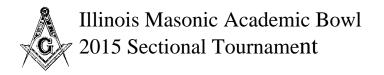
#### Question #25: Literature – U.S. Literature

10 points per part

	s resident of Cross Corners grew more unlucky the more dren he had.	
1	Name this man who vowed to sell his soul for two cents after striking a rock with his plow.	Jabez Stone [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	Daniel Webster
3	Benet [bih-NAY]. In real life, this person was a senator and secretary of state.  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	Ichabod Crane [accept either]
	this fictional New York resident scared off by the Headless Horseman.	

#### Question #26: Literature - U.S. Literature

	s oration begins with a quote from Deuteronomy 32:35; neir 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.	"Sinners in the Hands of an Angry God"
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.	Sodom [prompt on Sodom and Gomorrah]



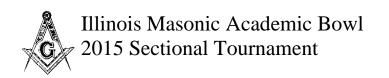
## **Question #27: Math – Analytical Geometry**

10 points per part

	h point on this line is equidistant from the endpoints of egment.	
1	Give this two word phrase that describes the relationship of the line to the segment.	perpendicular bisector
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 "½" or ".5"]
3	Find the y-intercept of the perpendicular bisector of the same segment.	<b>9</b> [or (0, <b>9</b> )]

## **Question #28: Math – Analytical Geometry**

one	riangle is placed in the coordinate plane so that it has vertex at the origin, one vertex at the point (2,6), and ther 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>



## Round # 7 5<sup>th</sup> Section Toss-up Questions

#### **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.

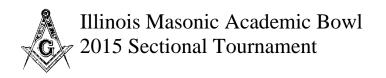
<u>K</u>omitet <u>G</u>osudarstvennoy <u>B</u>ezopasnosti [accept <u>Committee</u> <u>for State Security</u>, do not accept "Glavnoye razvedyvatel'noye upravleniye" or "Main Intelligence Directorate"]

#### **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.

#### **echinoderm**ata



## Round # 7 5<sup>th</sup> Section Toss-up Questions

## **Question #31: Math – Math Concepts**

10 points

In the Moulton example of this construct, some lines are	<b>plane</b> s
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.	

#### **Question #32: Literature – British Literature**

This author used the Serbo-Bulgarian War as a backdrop	George Bernard Shaw	
for a drama in which a "chocolate cream soldier" inherits a		
large fortune; that play takes its title from the opening line		
of the <i>Aeneid</i> [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 <i>Arms</i>		
and the Man and Major Barbara who wrote of the		
cockney girl Eliza Doolittle in <i>Pygmalion</i> .		

# Round # 7 Extra Section Toss-up Questions

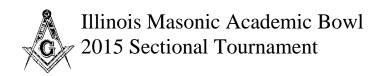
## Extra Question #1: Fine Arts - Classical/Opera

10 points

This composer used a chord composed of the notes F, B, D-	Richard Wagner
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	
Parsifal, Lohengrin, and Tristan und Isolde who also wrote	
the Ring Cycle.	

# Extra Question #2: Math – Math Concepts

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 cubed plus Y cubed minus three A X Y equals zero, 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.	Rene <u>DesCartes</u>	
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# Round # 7 Extra Section Toss-up Questions

#### 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.

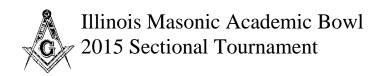
<u>Tiananmen</u> Square Protests [accept <u>June Fourth</u> Incident]

#### 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.

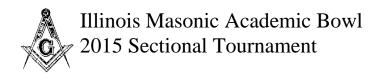
<u>Earnest</u> [accept *The Importance of Being Earnest*]



# Round # 7 Extra Section Toss-up Questions

## Extra Question #5: Science - Earth Science

A common system for classifying this pattern was modified	<u>climate</u>
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.	



# Round # 7 Extra Section Teamwork Questions

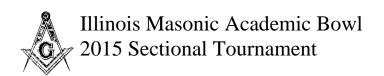
## Extra Question #6: Social Studies - U.S. History

10 points per part

	this battle, George Washington erroneously thought he 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 <b>Brandywine</b>
2	Howe was assisted at Brandywine by this general who would later surrender to the Americans at Yorktown.	Charles <u>Cornwallis</u> (or 1 <sup>st</sup> 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 Wayne

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

	or to this battle, Tenskwatawa convinced his forces that 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.	William Henry Harrison [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>



# Round # 7 Extra Section Teamwork Questions

## Extra Question #8: Math – Probability

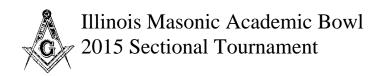
10 points per part

Che	evalier de Mere posed a problem that some	
mat	hematicians claim started the study of probability	
the	ory.	
	De Mere's question led to several letters between	Blaise <u>Pascal</u>
1	Pierre de Fermat and this other mathematician whose	
1	name is used for a triangular arrangement giving	
	binomial coefficients.	
	The problem that de Mere raised involved rolling a pair	<u>35/36</u> [or 0 <u>.972 repeating</u> ]
2	of dice 24 times and seeing if a double six came up at	
4	all. That problem can be solved by raising this number	
	to the 24 <sup>th</sup> power.	
	Other early developments in probability theory	Gottfried Wilhelm <u>Leibniz</u>
	involved letters between this mathematician and Jakob	
3	Bernoulli [bur-NOO-lee]. This mathematician and	
	Isaac Newton are credited with independently	
	developing calculus.	

### Extra Question #9: Math – Probability

If an experiment consisted of choosing a card from a deck,

the	n 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.	sample space [or probability space]
2	This term describes any subset of the sample space. Probabilities are typically assigned to these entities.	event
3	If you are picking a random card from a standard 52-card deck, what is the probability of picking a red three?	1/26



#### Round # 8 1<sup>st</sup> Section Toss-up Questions

#### **Question #1: Fine Arts – Art History**

10 points

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 *School of Athens* can be found, as well as *The Last Judgement* and Michelangelo's paintings on the ceiling of the Sistine Chapel.

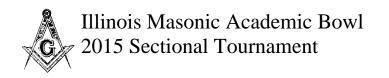
Vatican City (do not accept "Rome")

#### **Question #2: Literature – British Literature**

10 points

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.

#### "Ode to the West Wind"



### Round # 8 1<sup>st</sup> Section Toss-up Questions

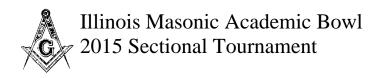
## **Question #3: Social Studies – U.S. History**

10 points

The negotiations involved in this agreement provided	Louisiana Purchase
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.	

## **Question #4: Math – Math Concepts**

	το ροιπιο
The sum of the non-negative powers of the reciprocal of this	two
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.	



#### Round # 8 1<sup>st</sup> Section Toss-up Questions

#### **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.

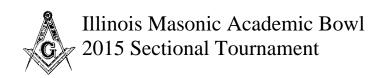
#### Carl Friedrich Gauss

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



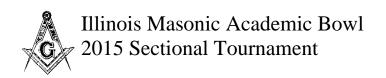
## **Question #7: Math – Geometry**

10 points per part

Tra	pezoids 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.	28 square units

## **Question #8: Math – Geometry**

At	least one thing can be built from pentagons.	
1	Name the Platonic solid whose faces are pentagons.	dodecahedron [or dodecahedra]
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.	tessellation [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.	360 degrees



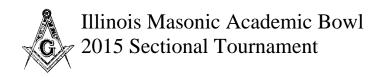
#### **Question #9: Literature – British Literature**

10 points per part

	described Washington, DC as a headquarters for bacco-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 <b>Dickens</b>
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 by</i> this pseudonym.	Boz
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.	Edwin Drood [accept either]

#### **Question #10: Literature – British Literature**

	Palace of Green Porcelain was found within the itory 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.	Eloi [eh-LOY]
2	The Eloi are encountered in the year 802,701 AD in this science fiction novel.	The <u>Time Machine</u>
3	The Time Machine was penned by this author of The Invisible Man.	Herbert George "H.G." Wells



## **Question #11: Science – Biology**

10 points per part

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

## **Question #12: Science – Biology**

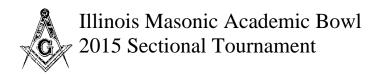
Thi	s process involves water traveling through plants.	
1	Name this process that includes evaporation from leaves.	transpiration [accept word forms]
2	Much of the evaporation that takes place at the end of transpiration goes through these tiny holes on leaves.	stomata [or stomates or stomas]
3	This is 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

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

### **Question #14: Fine Arts – Classical/Opera**



#### Round # 8 3<sup>rd</sup> Section Toss-up Questions

#### **Question #15: Social Studies – World History**

10 points

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 *Panay*. 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.

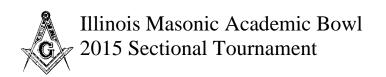
Empire of <u>Japan</u> [or <u>Nippon</u>-koku or <u>Nihon</u>-koku]

#### **Question #16: Science – Astronomy**

10 points

In 2012, NASA's *Living With a Star* 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.

<u>Van Allen</u> radiation belt [prompt on <u>radiation belt</u>]



### Round # 8 3<sup>rd</sup> Section Toss-up Questions

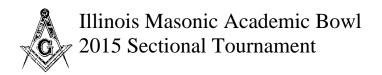
## **Question #17: Miscellaneous – Pop Culture**

10 points

During a musical performance on this show, a picture of	Saturday Night Live [accept SNL]
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.	

#### **Question #18: Literature – U.S. Literature**

In this novel, the main character is lashed with a riding crop	The <b>Fountainhead</b>	
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.		



### Round # 8 3<sup>rd</sup> Section Toss-up Questions

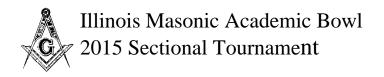
## **Question #19: Science – Biology**

10 points

This animal class includes species almost made extinct by	reptiles [or reptilia]	
Polynesian rats, the tuataras [twah-TAH-rahs]. Some extinct		
members of this animal class are now classified as		
euryapsids [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.		

## **Question #20: Social Studies – U.S. History**

This election saw Libertarian John Hospers win an electoral	United States Presidential Election
vote from a faithless elector. During this election, the loser	of <u>1972</u>
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.	



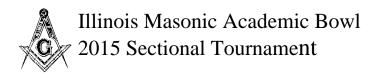
## **Question #21: Social Studies – World History**

10 points per part

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

## **Question #22: Social Studies – World History**

	s disaster was brought about by the mold <i>Phytophthora</i> -tof-THOR-ah] <i>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	Irish Potato Famine [accept Great Irish Famine of 1845 or Gorta Man propert on Irish or Potate
	a certain vegetable. The first proactive steps from London involved shipping corn.	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 <u>Peel</u>
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.	<u>United States</u> of America [accept equivalents]



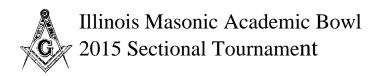
## **Question #23: Math – Trigonometry**

10 points per part

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

## **Question #24: Math – Trigonometry**

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



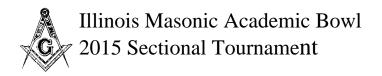
#### Question #25: Literature - U.S. Literature

10 points per part

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

#### Question #26: Literature - U.S. Literature

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



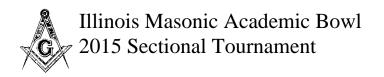
## **Question #27: Science – Physics**

10 points per part

	ssical physics is often used to analyze the motion of an ect 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.	mechanical advantage

## **Question #28: Science – Physics**

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



# Round # 8 5<sup>th</sup> Section Toss-up Questions

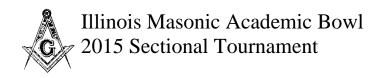
## **Question #29: Math – Math Concepts**

10 points

The diagram demonstrating Desargues' [day-zahrg's]	<u>ten</u>	
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.		
•		

## Question #30: Social Studies – U.S. History

Despite the machinations [ma-kuh-NAY-shuns] of Patrick	Province of <b>Georgia</b>	
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.		



# Round # 8 5<sup>th</sup> Section Toss-up Questions

#### **Question #31: Science – Chemistry**

10 points

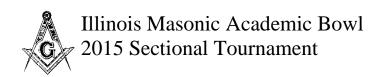
After Ulrich Schneider passed this threshold in 2013 using potassium, he suggested that his studies could explain dark energy. Fermi energy is defined at this condition, and this value holds for all quantum critical points. Walther Nernst stated that this condition could not be reached in a finite number 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.

#### **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]



# Round # 8 Extra Section Toss-up Questions

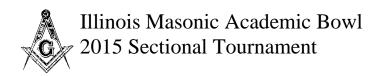
## Extra Question #1: Fine Arts – Art History

10 points

This person painted a man holding back a curtain to reveal	Grant Wood
George Washington as a child wielding an axe in <i>Parson</i>	
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.	

## Extra Question #2: Science – Biology

This genus includes the extinct lepophagus	canis [accept canines or canids,
[leh-PO-fuh-gus] species that ate rabbits and the dirus	do not accept dogs]
[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.	



# Round # 8 Extra Section Toss-up Questions

#### Extra Question #3: Math – Math Concepts

10 points

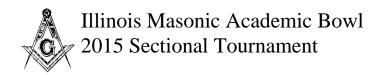
One test of these numbers is named for the infinite monkey	<u>random</u> numbers
theorem, while another is named for the birthday paradox.	
Nineteen thousand, nine hundred thirty-seven is often used	
in the Mersenne twister, which commonly is used to create	
these numbers, as is the thermal noise in 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.	

#### 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.

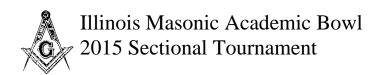
Marcus Junius <u>Brutus</u> [accept <u>Quintus Caepio Brutus</u> or <u>Brute</u>]



# Round # 8 Extra Section Toss-up Questions

### Extra Question #5: Literature – World Literature

One character in this play references a lost container of oil	The Frogs [accept Batrachoi]
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].	



# Round # 8 Extra Section Teamwork Questions

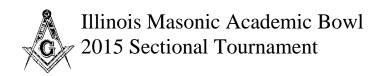
## Extra Question #6: Social Studies – World History

10 points per part

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

#### Extra Question #7: Social Studies - World History

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



# Round # 8 Extra Section Teamwork Questions

## Extra Question #8: Science – Physics

10 points per part

The	ese are the objects that move through electric circuits.	
1	Name these negatively charged objects often found in atomic orbitals.	<u>electron</u> s
2	Electrons, muons, and taus are three of the six particles in this category.	<u>lepton</u> s
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>baryon</u> s

## Extra Question #9: Science - Physics

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.		
	Name this person who shared the 2013 Nobel Prize in	Peter <u>Higgs</u>
1	Physics with Francois Englert when the elementary	
	particle named for him was confirmed to exist.	
	The existence of the particle was confirmed by this	<b>CERN</b> [or <b>European Council for</b>
2	organization whose research center is located at the	Nuclear Research or
4	border between France and Switzerland.	Organisation Europeen pour la
		Recherche Nucleaire
	Some of the initial experiments leading up to the	<u>Tevatron</u>
3	discovery of the Higgs boson were done using this	
	particle accelerator at Fermilab in Illinois that closed in	
	2011.	