

Round 3 1st Section Toss-up Questions

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

10 points

The first Cabinet nomination to be rejected was a recess appointment of Roger Taney [TAW-nee] to head this department. In the line of succession, the leader of this department follows the Secretary of State. Prior to the creation of the Department of Homeland Security, the Secret Service was under this department, which still includes the Internal Revenue Service. It was first headed by Alexander Hamilton, and is now led by Jack Lew. Name this Cabinet department that oversees the United States Mint.

Department of the **Treasury** [accept Secretary of the **Treasury**; accept Roger (Brooke) **Taney** before "Roger"]

Question #2: Miscellaneous – Agriculture

10 points

The Karakul are the only fat-tailed breed of this animal		
found in the United States. The Book of Genesis		
features a spotted breed of this animal owned by Jacob.		
In the Western United States, the Rambouillet		
[ram-boo-yeh] breed of this animal is the most		
common. Milk from this animal is the main ingredient		
in ricotta and roquefort [ROHK-for] cheeses. Lanolin		
comes from the glands of these creatures. Depending		
on age, meat from this animal is called mutton or lamb.		
Name this animal, the primary source of wool.		

sheep [accept **lamb** before it is mentioned]



Round 3 1st Section Toss-up Questions

Question #3: Science – Astronomy

10 points

The Magellan spacecraft mapped the surface of this	<u>Venus</u>
planet, including the Colette and Sacajawea	
[SAK-uh-juh-WEE-uh] calderas on the Lakshmi	
[LAK-shmee] Planum. Scientists have not figured out	
why concentric fractured ovals called arachnoids	
[uh-RAK-noydz] form on the surface of this planet. Its	
mass is the closest of all the Solar System planets to the	
mass of Earth. Of the terrestrial planets, this one has by	
far the greatest surface pressure due to the high density	
of carbon dioxide in its atmosphere. The greenhouse	
effect contributes to this planet being the hottest one in	
the solar system. Name this second planet from the	
Sun.	

Question #4: Literature – U.S. Literature

The eyes of the title figure in this poem "have all the	"The Raven "
seeming of a demon's that is dreaming". The narrator	
of this poem asks "is there balm in Gilead?" before	
directing the title creature "back into the tempest and	
the Night's Plutonian shore". The narrator of this poem	
implored for forgiveness for "the fact that I was	
napping, / and so gently you came rapping". This poem	
opens with the line, "Once upon a midnight dreary,	
while I pondered, weak and weary". Name this Edgar	
Allan Poe poem in which "Nevermore" is uttered by the	
title bird.	



Round 3 1st Section Toss-up Questions

Question #5: Social Studies – World History

10 points

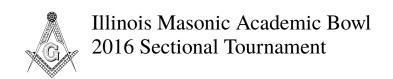
(Republic of) **Colombia** [or República de **Colombia**]

Question #6: Science – Chemistry

10 points

Ethers [EE-thurz] of this element are used to protect alcohols in organic synthesis. This element is bonded to four carbons in the zero-chemical-shift NMR standard TMS. This compound bound to oxygen is used in resins for chromatography, and it serves as a dessicant. This compound is found in diatomaceous ["DIE"-uh-tuh-MAY-shus] earth, since diatoms [DIE-uh-toms] integrate this element into their cell walls. Like germanium [jur-MAY-nee-um], this element's small band gap makes it an effective material for semiconductors. Name this element whose oxide comprises quartz, and whose atomic symbol is Si [S-I].

silicon [accept Si before the end]



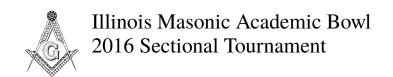
Question #7: Fine Arts – Musical Theatre

10 points per part

In th	nis musical, Max Bialystock and Leo Bloom	
cons	spire to stage an intentionally horrible musical.	
1	Name this musical based on a Mel Brooks film.	The Producers
2	This is the name of the musical that they produce. Its title song contains the line "The Führer is causing a furor."	"Springtime for Hitler"
3	The Producers broke the record for Tony Awards, which had previously been held by this musical about a woman who wants to marry Horace Vandergelder.	Hello, Dolly!

Question #8: Fine Arts – Musical Theatre

Nea	r the opening of this musical, several politicians	
sing	"Sit down, John!".	
1	Name this musical about the drafting of the	<u>1776</u>
	Declaration of Independence.	
2	In 1776, this character sings about being from the	Richard Henry Lee
	first family of Virginia.	
3	One of the musicals that 1776 beat out for the 1969	<u>Hair</u>
	Tony is this one featuring the song "Age of	
	Aquarius".	



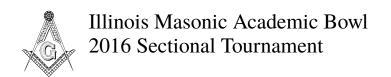
Question #9: Science – Biology

10 points per part

The	se organelles contain stacks of thylakoids	
["TI	HIGH"-luh-koydz] which are surrounded by the	
fluic	l stroma [STROH-mah].	
1	Name these organelles in which photosynthesis	chloroplast s
	takes place.	[KLOR-oh-plasts]
2	Chloroplasts contain chlorophyll [KLOR-oh-fil], which absorbs red and blue light and reflects this primary color of light.	green
3	Chlorophyll consists of a porphyrin [POR-fuh-rin] ring coordinated to a central atom of this element.	magnesium [accept Mg]

Question #10: Science – Biology

The	se compounds are linked together by peptide	
bone	ds.	
1	Name these molecules that make up proteins. Of	amino acids
	the twenty common examples, nine of them are	
	"essential".	
2	Amino acids are linked together to form proteins in	translation [accept answers
	this process, in which an mRNA transcript is read	mentioning translating]
	on a ribosome ["RYE"-boh-sohm].	
3	This smallest amino acid is the only one that is not	glycine [GLY-seen]
	chiral [KY-rul].	



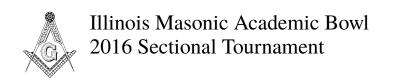
Question #11: Literature – Mythology

10 points per part

One	of this god's epithets means "He Who Is In the	
Plac	ee of Embalming".	
1	Name this jackal-headed god who served as the	Anubis [accept Anpu or
	psychopomp, or guide for dead souls, in the	<u>Inpu</u>]
	Egyptian underworld.	
2	In the Egyptian underworld, if one's heart weighed	Ammit
	unfavorably against the feather of Ma'at, this	
	demon — depicted with a crocodile head — would	
	devour the heart.	
3	In the trial, this husband of and brother of Isis	<u>Osiris</u>
	served as the judge. This god was killed by Set but	
	was able to father Horus after dying.	

Question #12: Literature – Mythology

mot	s god was born from his father's thigh after his her was killed by being exposed to his father's	
glor	y.	
1	Name this youngest of the Olympians who was	Dionysus ["die"-uh-NY-sis]
	rescued from Semele's [SEH-muh-lee'z] womb. In	[accept Bacchus or
	another tale, he was ripped to shreds by the Titans,	Zagreus]
	but his heart was implanted in Semele.	
2	Dionysus granted a wish to this Phrygian	King Midas
	[FRIJ-ee-un] king. This king decided that	
	everything he touches should turn to gold.	
3	After being kidnapped, Dionysus turned a group of	dolphin s
	sailors into these animals.	_



Question #13: Mathematics – Geometry

10 points per part

The	base of this kind of solid may be any polygon,	
and	all the other faces must be triangles.	
1	Name these solids that have a point on top called an	pyramid s
	apex [AY-peks].	
2	This is the name of the triangle-based pyramid that	tetrahedron [or tetrahedra;
	is a Platonic [pluh-TAH-nik] solid.	prompt on 3-simplex
3	If the base of a pyramid is an octagon, how many	<u>16</u> edges
	total edges does the pyramid have?	

Question #14: Mathematics – Geometry

Bral	area of this kind of shape can be found using hmagupta's [brah-muh-GOOP-tah's] formula if it	
18 Cy	Name this class of polygons with four sides and no other restrictions.	quadrilaterals or quadrangles
2	This type of quadrilateral has one pair of parallel sides.	trapezoids [or trapeziums]
3	Find the area of an isosceles ["eye"-SAH-seh-lees] trapezoid if its bases are three units and seven units long, and its other sides are each five units long.	5 root 21 square units [or 5 times the square root of 21 or 5 radical 21 or equivalents]



Round 3 3rd Section Toss-up Questions

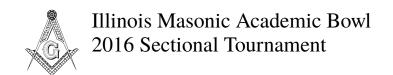
Question #15: Literature – British Literature

10 points

One poem by this person is narrated by a soldier who	Alfred, Lord Tennyson
asks his comrades to leave him and states "Knowledge	
comes, but wisdom lingers." This writer of "Locksley	
Hall" wrote the line "Tis better to have loved and lost	
than never loved at all" in a poem dedicated to another	
poet. The speaker of another poem by this author hopes	
"to see [his] Pilot face to face" while performing the	
title action in "Crossing the Bar." In one of his poems,	
600 soldiers ride into the valley of Death. Name this	
author of "In Memoriam A.H.H." and "The Charge of	
the Light Brigade".	

Question #16: Science – Physics

This quantity is the boundary between a space-like and	speed of light [or c or
a time-like interval. Calculations of the Lorentz factor	velocity of light]
use the ratio of a particle's velocity and this quantity.	
The non-existence of the luminiferous ether	
[loo-min-IF-ur-uss EE-thur] was shown by analyzing	
this value in different directions in the	
Michelson-Morley experiment. Special relativity	
assumes that this quantity is constant in all reference	
frames. Energy is equivalent to rest mass times this	
quantity squared. Name this quantity that in a vacuum	
is about equal to three times ten to the negative eighth	
meters per second.	



Round 3 3rd Section Toss-up Questions

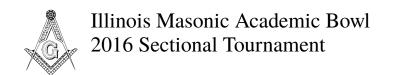
Question #17: Fine Arts – Art History

10 points

A jeweled Tiffany glass screen was added to this	White House
building in 1882, the year after most of its contents	
were sold at public auction. The south and north	
porticos were added to this building 24 and 29 years,	
respectively, after the original part was built. It has a	
Vermeil [vur-MEE-il] Room named for the tableware	
used in it. This building is located between Lafayette	
Square and The Ellipse. James Hoban designed it after	
Pierre Charles L'Enfant was fired by George	
Washington. Name this building at 1600 Pennsylvania	
Avenue, whose West Wing includes the Oval Office.	

Question #18: Mathematics – Math Concepts

The average value for this quantity can be found using a	slope [prompt on first
difference quotient. The length of a line on a graph can	<u>derivative</u>]
be calculated by multiplying the change in <i>x</i> by the	
square root of the quantity one plus this quantity	
squared. The arctangent of this value gives the angle	
between a line and the <i>x</i> -axis. This quantity equals the	
opposite of the <i>x</i> coefficient divided by the <i>y</i> coefficient	
if a line is given in standard form, while in other forms	
for a line, it acts as a coefficient of x, and is often	
represented by the letter m . Name this value equal to	
the change in y divided by the change in x , also known	
as rise over run.	



Round 3 3rd Section Toss-up Questions

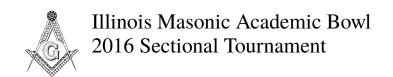
Question #19: Social Studies – U.S. History

10 points

Abraham Lincoln called a governor of this state "the	<u>Indiana</u>
skeerdest man I know of". A safe in that governor's	
office was deemed a "Bureau of Finance" established	
by Oliver Morton. Dan Quayle and Benjamin Harrison	
represented this state in the U.S. Senate. This state was	
where George Rapp founded his utopian community,	
New Harmony. William Henry Harrison defeated	
Tecumseh at Prophetstown in this state. Its recent	
governors have been Evan Bayh ["bye"], Mitch Daniels,	
and Mike Pence. Name this Hoosier state bordered to	
its west by Illinois.	

Question #20: Literature – World Literature

A short story by this author opens at Verney's pavilion,	Anton (Pavlovich) Chekhov
where Dmitri Gurov saw a woman and her Pomeranian.	
This writer of "The Lady With the Dog" concluded one	
of his works with the footman Firs lying down in front	
of a locked door as axes are heard cutting down the title	
location. In a letter to Aleksandr Lazarev, he wrote	
"One must not put a loaded rifle on the stage if no one is	
thinking of firing it." Olga, Maria, and Irina	
[eh-REE-nah] are the title <i>Three Sisters</i> in one of his	
plays. Name this Russian playwright who wrote <i>The</i>	
Seagull and The Cherry Orchard.	



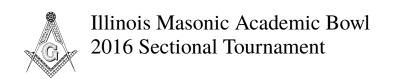
Question #21: Science – Chemistry

10 points per part

	en it is used in construction and gardening, this pound is called muriatic [myur-ee-AT-ik] acid.	
1	Name this chemical whose formula is HCl ["HCL"].	hydrochloric ["HIGH"-droh-KLOR-ik] acid [accept hydrogen chloride]
2	Hydrochloric acid is mixed with nitric ["NIGHT"-rik] acid in a three-to-one ratio to produce this substance, named for its ability to dissolve gold.	aqua regia ["AQUA" REE-jee-uh]
3	Hydrochloric acid is secreted by the parietal [puh-RIE-uh-tul] cells of this organ to aid in digestion.	stomach

Question #22: Science – Chemistry

This	s phenomenon allows some bugs to walk on water.	
1	Name this phenomenon caused by cohesive forces	surface tension
	in a liquid.	
2	Surface tension causes the formation of this curved	meniscus [muh-NISS-kuss]
	structure, which is concave in water and convex in	[prompt on crescent]
	mercury. When reading the volume of water in a	
	graduated cylinder, one looks at the bottom of one	
	of these structures.	
3	Compounds that lower surface tension are given	surfactants
	this name. Detergents are an example of these	
	substances, which the lungs produce to prevent	
	alveoli [al-vee-OH-"lie"] from collapsing.	



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

10 points per part

Gris	selio Torresola [gree-SAY-lee-oh tor-ay-SOH-lah]	
and	Oscar Collazo [koy-YAH-zoh] attempted to	
assa	ssinate this president to gain attention for Puerto	
Rica	an independence.	
1	Name this president who won the 1948 election,	Harry S. Truman
	though the <i>Chicago Tribune</i> printed a headline	
	claiming Dewey had defeated him.	
2	This law–also called the Labor Management	Taft-Hartley Act
	Relations Act–outlawed closed shops, and passed	
	over Truman's veto; he wanted to repeal it as part	
	of the Fair Deal.	
3	Omar Bradley defended Truman's firing of this	Douglas MacArthur
	general, claiming that this general "would have	_
	involved us in the wrong war in the wrong place at	
	the wrong time against the wrong enemy".	

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

Ker	mit Tyler committed a fatal mistake in the buildup	
to th	nis event.	
1	Name this ambush that resulted in the sinking of	the Japanese attack on Pearl
	the USS <i>Arizona</i> , but failed in its primary goal of taking out the United States Pacific Fleet.	Harbor [accept equivalents]
2	In a speech the following day, this president described December 7, 1941 as "a day which will live in infamy".	Franklin Delano Roosevelt [accept FDR; prompt on Roosevelt]
3	This Japanese admiral, who was the chief architect behind the Pearl Harbor attack, predicted that Japan would lose a prolonged conflict. He was shot over Bougainville Island in an ambush.	Yamamoto Isoroku [accept names in either order]



Question #25: Literature – British Literature

10 points per part

Mul	ciber [MUL-sih-bur] was the chief designer of	
this	capital, whose builders used liquid fire and gold	
in it	s construction.	
1	Name this capital of hell, where Satan boasts about	Pandemonium
	his success against man.	
2	The second book of this epic poem opens with a	Paradise Lost
	debate taking place in Pandemonium. This epic	
	retells the story of Adam and Eve.	
3	This blind poet wrote <i>Paradise Lost</i> . The death of	John Milton
	Edward King inspired his poem "Lycidas	
	["LIE"-sih-dus]."	

Question #26: Literature – British Literature

Resi	idents of this faraway land built a "traveling box"	
for a	a diminutive guest of the queen.	
1	Name this location where Glumdalclitch	Brobdingnag
	[GLUM-dul-klich] makes clothes and joins the	[BRAHB-ding-nag]
	queen's court as a nurse to one of the queen's	
	favorites.	
2	This doctor fled Lilliput and spent time in Blefuscu	(Dr.) Lemuel Gulliver
	[BLEH-fusk-yoo] before arriving in Brobdingnag.	[accept either underlined
	He was mistaken for a Yahoo in the Land of the	name]
	Houyhnhnms [WIN-imz].	
3	This author wrote <i>Gulliver's Travels</i> .	Jonathan Swift



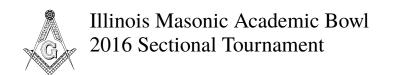
Question #27: Mathematics - Pre-Calculus

10 points per part

This number equals the limit as <i>x</i> approaches infinity		
of the quantity 1, plus 1 over x, end quantity, raised to		
the 3	x power.	
1	Name this irrational number, approximately equal	<u>e</u> [or <u>Euler</u> 's <u>number</u> or
	to 2.718.	Napier's constant, do not
		accept "Euler's constant"]
2	Evaluate the expression the quantity one plus one divided by <i>x</i> , end quantity, raised to the <i>x</i> power when <i>x</i> equals three.	64/27 [or 2 + 10/27 or 2.370 repeating]
3	e also equals the sum of the reciprocals of all	<u>8/3</u> [or <u>2 + 2/3</u> or <u>2.6</u>
	factorials. Find the value of 1 divided by 0	repeating]
	factorial, plus 1 divided by 1 factorial, plus 1	
	divided by 2 factorial, plus 1 divided by 3 factorial.	

Question #28: Mathematics – Pre-Calculus

This	s is a point where the second derivative of a	
function changes either from positive to negative, or		
fron	n negative to positive.	
1	Name this type of point where concavity changes.	inflection point [or point of
		inflection]
2	Find the <i>x</i> -coordinate of the point of inflection for the graph of <i>y</i> equals the sine of <i>x</i> , within the open interval from <i>x</i> equals zero to <i>x</i> equals 2 pi radians. This point is also the only zero of the function in that interval, and is equivalent to 180 degrees.	(one (times)) pi radians
3	Find the <i>x</i> -coordinate of the point of inflection for the graph of <i>y</i> equals <i>x</i> cubed minus <i>x</i> squared.	x = 1/3 [or 0.3 repeating]



Round 3 5th Section Toss-up Questions

Question #29: Social Studies – World History

10 points

The power of this person was increased by Georges	Maximilien (Francois Marie
Couthon's [zhorzh koo-tawn'z] Law of 22 Prairial,	Isidore de) Robespierre
though that law also increased Jean-Lambert Tallien's	
[zhahn lam-bair tall-ee-en'z] desire to overthrow him.	
This founder of the Cult of the Supreme Being was the	
head of the Paris delegation at the National Convention.	
Louis de Saint-Just [loo-ee day sawn-zhoos] attempted	
to set up a dictatorship with this man — known as "the	
Incorruptible" — at the helm, but he was arrested on	
the 9th of Thermidor. Name this leader of the Jacobins	
[zhah-koh-banz], who headed the Committee of Public	
Safety and ruled France during the Reign of Terror	
before he was guillotined.	

Question #30: Science – Biology

Giemsa [GIM-suh] can be used to stain these structures.	chromosome s
The long arms of these structures are labeled q , while	
their short arms are labeled p . The saliva glands of fruit	
flies contain oversized examples of this kind of	
structures, called "polytene". An abnormal number of	
these is called an aneuploidy [AN-yoo-ploy-dee].	
These structures are shown from longest to shortest,	
followed by sex-specific ones, in a karyotype	
["CARE"-ee-oh-"type"]. An extra one of these	
structures is called a trisomy ["TRY"-soh-mee], one	
example of which is Down's syndrome. Name these	
structures of which humans have 46 per cell, and whose	
X and Y varieties determine sex.	



Round 3 5th Section Toss-up Questions

Question #31: Mathematics – Math Concepts

10 points

If a matrix has this property, then its eigenvectors are			
orthogonal. The number of items conserved in a			
physical system equals the number of versions of this			
property it has. The graph of a periodic function			
exhibits the translational type of this property, and may			
also exhibit the even or odd type of this property.			
Regular polygons have both the rotational and			
reflectional type of this property. Name this property			
that is said to be of the "reflection" type for an object			
that is the same as its mirror image.			

symmetry [accept
symmetric (matrix)]

Question #32: Literature – U.S. Literature

10 points

The opening stanza to one of this author's poems thrice	T(homas) S(t
repeats the phrase "because I do not hope". In another	
of his poems, the speaker is "no longer at ease here, in	
the old dispensation". This author of "Ash Wednesday"	
and "The Journey of the Magi" opened one work with	
the line "Mistah Kurtz — he dead." In that poem, the	
speaker claims "this is the way the world ends, not with	
a bang but with a whimper." Another poem by this	
writer begins its opening section, "The Burial of the	
Dead", with the line "April is the cruellest month."	
Name this author of "The Hollow Men" and "The	
Waste Land."	

T(homas) S(tearns) Eliot



Round 3 Extra Section Toss-up Questions

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

10 points

In this presidential election, the Democratic candidate was a U.S. Senator from Michigan who was both a former and future Secretary of State. That candidate's support of popular sovereignty caused William Yancey to remove Alabama's delegates from the convention. During this election, Conscience Whigs and former Liberty Party members formed the Free Soil Party, which nominated Martin van Buren. The winner of this election was a Mexican War hero who died in office two years later. Name this presidential election won by the ticket of Zachary Taylor and Millard Fillmore.

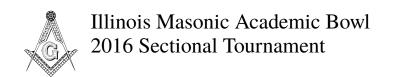
United States presidential election of **1848** [prompt on answers referring to the election of Zachary **Taylor**]

Extra Question #2: Mathematics – Math Concepts

10 points

Brianchon's [bree-ahn-shawn'z] theorem states that these shapes have concurrent diagonals if they can be circumscribed about a conic section, in which case they have collinear diagonal intersections according to Pascal's theorem. Regular examples of this kind of shape have the most sides of any regular polygon that can tile the plane, and in regular examples of these shapes, the *exterior* angles and central angles are each 60 degrees. Name this polygon, often broken into equilateral triangles, which has six sides.

hexagons [prompt on
6-gons]



Round 3 Extra Section Toss-up Questions

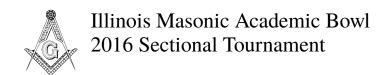
Extra Question #3: Fine Arts – Composers of the Modern Era

10 points

Starting in 1928, this person hosted a series of concerts	Aaron <u>Copland</u>
with Roger Sessions that featured music by young	
composers, including his own Two Pieces for String	
Quartet. This composer wrote an opera specifically for	
school performances, The Second Hurricane, and an	
opera set on a Midwestern farm during the Depression,	
The Tender Land. Martha Graham commissioned him	
to write an American ballet, which ended up	
incorporating the Shaker melody Simple Gifts, and he	
used cowboy songs in his ballet Billy the Kid. Name	
this composer of Appalachian Spring and Rodeo	
[roh-DAY-oh].	

Extra Question #4: Literature – World Literature

	,
This author wrote of the relationship between the	Isabel Allende [EE-sah-bel
reporter Irene Beltran and photographer Francisco Leal	"eye"-YEN-day] (Llona)
in Of Love and Shadows. In another novel, Alexander	
Cold travels to the home of the <i>People of the Mist</i> . This	
author of City of the Beasts wrote about the former	
fiance of Rosa the Beautiful knocking out Clara's teeth;	
Clara had ended her nine-year silence to declare that	
she would marry the patriarch of Las Tres Marias,	
Esteban Trueba [ES-tay-bahn "true"-AY-bah]. Name	
this author of <i>House of the Spirits</i> , a Chilean novelist.	



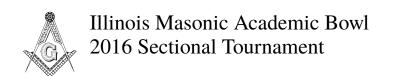
Round 3 Extra Section Toss-up Questions

Extra Question #5: Science - Health

10 points

This symptom can be caused by the tumors of neurofibromatosis [noo-roe-fie-broe-mah-TOE-sis] type two. In addition to thyroid problems, this symptom is caused by Pendred syndrome. In the future, this symptom may be treated by altering the transmembrane channel-like one gene. This symptom is called presbycusis [pres-bih-KYOO-sis] in old people, in whom it is common, and the permanent type of this symptom is called sensorineural. It is often accompanied by tinnitus [tin-"EYE"-tiss]. This condition is sometimes helped by a cochlear ["COKE"-lee-ur] implant to the inner ear. Name this symptom whose sufferers may read lips or use sign language.

hearing loss [accept variations; accept **deaf**ness]



Extra Question #6: Social Studies – World History

10 points per part

The	ultimate goal of this uprising was "Constantine	
[KO	N-stun-teen] and a Constitution".	
1	Name this revolt in the winter of 1825 that attempted to prevent Nicholas I from becoming tsar. The five men executed for their role in it were hanged twice, as the ropes broke the first time.	Decembrist uprising [or Vosstanie dekabrist ov; accept similar naswers that include Decembrist s]
2	The Decembrist revolt took place primarily in this city. In 1925, the Senate Square in this city was renamed in honor of the revolt. This city was known as Leningrad when it was in the Soviet Union.	St. Petersburg
3	The revolt took place in this country.	Russia [or Russian Empire]

Extra Question #7: Social Studies – World History

Befo	ore this organization existed, there were	
simi	larly-oriented groups called a Common Market	
and	a Coal and Steel Community.	
1	Name this organization established by the	European Union or EU
	Maastricht [MAHSS-"tricked"] Agreement.	
2	In 2004, this Mediterranean island nation joined	Republic of Cyprus
	the EU despite ongoing disputes between the	
	Turkish-occupied north and the officially	
	recognized government of the southern area.	
3	Viktor Yanukovych's [yah-NOO-koh-vich'z]	<u>Ukraine</u> [or <u>Ukrayina</u>]
	refusal to sign a trade agreement with the EU on	
	behalf of this nation was one factor in his ouster as	
	president of this Eastern European nation.	



Extra Question #8: Mathematics – Trigonometry

10 points per part

There are six primary trigonometric functions.		
1	Which two of those functions have a period of pi radians?	tangent and cotangent [either order; for all parts, accept answers that additionally include a variable]
2	Which two of those functions never output zero?	secant and cosecant [either order; accept csc in place of cosecant]
3	Give the angle in radians between 0 and 2 pi where the cosine of x equals the cotangent of x .	pi over 2 [or one-half pi or pi divided by 2]

Extra Question #9: Mathematics – Trigonometry

The	y must be between 0 to 90 degrees.	
1	Name these angles that describe how far a given angle on the unit circle is from the <i>x</i> -axis.	reference angles
2	If an angle is in the second quadrant, what is the relationship between that angle and its reference angle?	supplementary angles [prompt on answers describing angles that add to 180 degrees or add to pi radians; prompt on answers that describe subtracting from 180 degrees or pi radians]
3	Find the reference angle for 311 degrees.	49 degrees