



The Illinois Mathematics and Science Academy of Aurora, IL,



in partnership with Loyola Academy of Wilmette, IL, present

IMSANITY 3

-ROUND 6-

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Tossups

- (1) The Rhind Papyrus in this system shows how to decompose fractions. A Cartouche surrounded important names in this system. Another document in this system granted tax exemption and other privileges to priests in its role as a donation stele. Thomas Young recognized that foreign names in this system were being (*) spelled out phonetically, but Jean-François Champollion finally deciphered this system. Used with Greek and Demotic on the Rosetta Stone, for ten points, name this system of writing used in Ancient Egypt.

ANSWER: Egyptian hieroglyphics (accept Hieratic hieroglyphs, do not accept “Demotic hieroglyphs”)

- (2) Every complete ordered field is isomorphic to this set of numbers. These numbers can be defined as equivalence classes of Cauchy sequences or they can be constructed as intervals of rational numbers called Dedekind cuts. Georg Cantor showed that no list could contain all of these numbers, which showed that the set of these numbers is (*) uncountable. Another way to define these numbers is as those with decimal expansions. For ten points, identify this set of numbers, consisting of all rational and irrational numbers, symbolized R .

ANSWER: real numbers (accept R before mention)

- (3) One politician from this state explained to Ian Murphy how he held up a picture of Ronald Reagan at a political dinner for his cabinet, and another politician from this state told reporters he felt he needed to bring his Glock handgun to work. Jeff Fitzgerald, Mark Neumann, and Eric Hovde lost this state’s senate primary to Tommy Thompson, who was defeated by the first lesbian congresswoman, (*) Tammy Baldwin. In 2011, fourteen Democratic senators fled the state to prevent a quorum for voting on an anti-union bill. For ten points, name this state in which Governor Scott Walker survived a recall election.

ANSWER: Wisconsin

- (4) In one short story by this author, a woman sacrifices herself to the Chilchui so the moon will return to them and another about the leader of “The Diggers Club,” Benjamin Cooley. In addition to writing *The Woman Who Rode Away* and *Kangaroo*, he wrote about the relationships between Ursula and Gudrun Brangwen, Gerald Crich, and Rupert Birkin in (*) *Women in Love*. He included Clara Dawes in a novel primarily about the relationship of Gertrude Morel to her sons, William and Paul in one work, and in another, Clifford’s paralysis prompts his wife Constance to have an affair with the gamekeeper Oliver Mellors. For ten points, identify this British author of *Sons and Lovers* and *Lady Chatterley’s Lover*.

ANSWER: David Herbert Lawrence

- (5) This feature appears in the right side of a work in which the left side is dominated by the titular *Watermill at Onden*. Three men on horseback ride toward this feature on a bending road in *Barrier Town on the Sumida River*. In another work, this feature can be seen reflecting in a lake over (*) Misaka pass, and it is seen in the background behind a boat being threatened by the titular ocean swell in *The Great Wave off Kanagawa*. Those work are part of a series by Katsushika Hokusai titled *Thirty Six Views of*, for ten points, which Japanese volcano?

ANSWER: Mount Fuji (prompt on “mountain” or “volcano”)

- (6) In one scene of this work, people keep repeating that “God is merciful”, and one character calls his wife darling for the first time shortly before she dies in childbirth. Another character in this novel is Sonya, who is in love with her cousin Nikolai and who looks after his children when he marries Maria. After losing 40,000 rubles in a gamble, the main character duels Dolokhov and joins the Freemasons, and Anatole Kuragin causes one character to break off her engagement with Andrei Bolkonskaya. At the end of this novel, (*) Natasha Rostov marries Pierre Bezukhov after he fights at the Battle of Borodino. Napoleon invades Russia in, for ten points, what longest novel of Leo Tolstoy?

ANSWER: War and Peace (or Voyna I Mir)

- (7) This leader subdued an uprising led by miners in cities such as Oviedo. He further gained fame during the Rif War as part of the Foreign Legion. With Sanjurjo and Mola, he attempted a coup against the Popular Front government. From his position at the Canary islands, this leader emerged victorious in a war that saw the bombing of Guernica. He implemented the Carlists into a party that Jose Antonio Primo de Rivera founded, the (*) Falange. After his death, he was succeeded by Juan Carlos I. The leader of the Nationalists during the Spanish Civil War, for ten points, name this military dictator of Spain.

ANSWER: Francisco Franco Bahamonde

- (8) This practice is often the translation of “Su shi”, practiced by Taoist monks. Sikhs are bound by this practice while in a Gurdwara but are not elsewhere. Calling it *ital*, Rastafarians engage in this practice believing that it increases their livly. Judeo-Christian practice stems from Genesis 1:29, although that was later reversed in Genesis 9:4. Abdul Baha argued that this practice should be performed by all except the sick. Jainism includes (*) not eating at night as part of this practice, which is required as part of ahimsa. For ten points, identify this practice of not eating meat.

ANSWER: vegetarianism (accept word forms)

- (9) Pericyclic reactions only take place when these entities are symmetrical in both products and reactants according to Woodward-Hoffmann rules, and the Jahn-Teller effect explains why degeneracy in these entities is unfavorable in complexes. They are eigenvalues of the Fock operator in the Hartree-Fock method of calculating them, and nodes in these entities can be either angular or radial. Mixing of these entities is called (*) hybridization, and they come in atomic and molecular varieties. Classified as *s*, *p*, *d*, or *f*, for ten points, name these regions of space that contain electrons.

ANSWER: orbitals

- (10) This thinker defined imagination to be a “decaying sense”, and in one of his works, Cicero speaks of a Roman judge who asks accusers “cui bono”. One of his works is divided into three sections: *Libertas*, *Imperium*, and *Religio*; that work, *De Cive*, forms a trilogy with *De Corpore* and *De Homine*. This philosopher’s most famous text notes that the “confederacy of deceivers” leads to a (*) “kingdom of darkness”. That work claims that the creation of a strong central government is the only solution to the “war of all against all”. For ten points, name this philosopher who wrote that the state of nature is “solitary, poor, nasty, brutish, and short” in his *Leviathan*.

ANSWER: Thomas Hobbes

- (11) John Imboden likely invented the story of this man’s raid caused by the denunciations of John Garrett. In addition to possibly raiding the B&O railroad, he was able to defeat John Fremont at Cross Keys during the Valley Campaign. After leading a charge against Oliver Howard’s right flank, he and his replacement A.P. Hill were both wounded. He led his namesake brigade in the Shenandoah Valley Campaign. After this man died due to (*) friendly fire at the Battle of Chancellorsville, Robert E. Lee said he had “lost his right arm.” For ten points, name this Confederate general who earned his nickname or unshaking defense at the First Battle of Bull Run.

ANSWER: Thomas Jonathan “Stonewall” Jackson

- (12) This composer wrote an overture celebrating the Battle of Vitoria for Johann Mazel's Panharmonicon as well as a D major piano trio with an especially haunting slow movement. In addition to *Wellington's Victory* and the "Ghost" trio, this man wrote a "Triple" Concerto for cello, violin, and piano. In one work by this man, a baritone soloist interrupts the orchestra by calling out "Oh friends, not these tones!", before being joined by a (*) choir singing of the "beautiful spark of the gods". For ten points, name this man whose Choral Symphony, his ninth, contains the section *Ode to Joy*.

ANSWER: Ludwig van Beethoven

- (13) One character in this play tells a bad joke about a preacher and a swearing parrot. Shaw and Kiefaber met the main character in Laurel, and another character explains the Napoleonic code to his wife and sister-in-law. The protagonist claims to have stayed in the Tarantula Arms after losing her home, Belle Reve, and Mitch decides he can't marry her after (*) Stanley Kowalski tells him about her past. Set in New Orleans and centered on a lady who has "always depended on the kindness of strangers," for ten points, name this play about Blanche DuBois written by Tennessee Williams.

ANSWER: A Streetcar Named Desire

- (14) Planck's constant times this quantity divided by wavelength yields vibrational energy. The mixing of a fine powder into a liquid reduces this quantity in the Hot Chocolate Effect. This quantity in fluids can be found by taking the square root of the quantity bulk modulus over density. Extreme vibrations and a cone-shaped cloud may form when objects (*) surpass this quantity, also known as "Mach 1". Approximately 340 meters per second at sea level, for ten points, name this quantity that is that measures the rate of motion of an acoustic wave.

ANSWER: speed of sound (accept equivalents, accept "Mach 1" before mention)

- (15) One member of this genus was used to disprove the single-species hypothesis, while another member is the earliest for which fossil evidence indicates bipedalism. One early fossil from this genus, discovered by Raymond Dart, is the Taung child. In 2010, researchers announced a new species in this genus named *sediba*. The most famous individual of this species, discovered in Ethiopia in 1974, is of the species (*) *afarensis* and is named Lucy. Including species like *anamensis* and *africanus*, for ten points, identify this extinct genus of hominid whose name means "southern ape".

ANSWER: Australopithecus (accept word forms like Australopith or Australopithecine)

- (16) In one work by this author, siblings Sibylla and Willgis have a son, Gregory, who marries his mother, becomes a hermit, and then becomes pope. This author of *The Holy Sinner* wrote about the outsider artist Tonio Kruger and the confidence man Felix Krull. He retold Genesis in *Joseph and His Brothers* and described a Lubeck merchant family in (*) *Buddenbrooks*. In a novel by this author, Leo Naphta and Ludovico Settembrini debate at the sanatorium in which Hans Castorp is recovering, and another novel has Tadzio be a point of obsessive interest for Gustav von Aschenbach. For ten points, identify this author of *The Magic Mountain* and *Death in Venice*.

ANSWER: Thomas Mann

- (17) This disease can be acquired through the introduction of the MPTP toxin and observable signs of it include alpha-synuclein aggregates and Lewy bodies. This disease was renamed by Jean-Martin Charcot in honor of the physician who first described it. Mainly treated with levodopa, damage in the substantia nigra causes the death of dopamine-producing neurons in this disease, which is also known as “the (*) shaking palsy.” For ten points, name this neurodegenerative disease characterized by a tremors and difficulties in muscle movement.

ANSWER: Parkinson’s Disease

- (18) This mathematician extended the binomial theorem to cover fractional exponents. In his *Method of Fluxions*, this man proposed an iterative method of following tangent lines to the x -axis to find zeroes of functions. The differential equation y prime is proportional to the difference between y and a constant is known as this man’s (*) Law of Cooling. This man showed that Kepler’s Laws were consequences of the inverse-square rule of his Universal Law of Gravitation in *Principia Mathematica*. For ten points, name this British mathematician who, independently of Leibniz, developed calculus.

ANSWER: Isaac Newton

- (19) This man wrote “Men willingly believe what they wish” in one work, and was quoted as saying “It is not the well-fed long-haired men I fear, but the pale and hungry looking.” After this man married Cornelia, he was removed from the position of Flamen Dialis, and he raised his ransom when he was captured by Cilician pirates. This man describes the Battle of Alesia, where he defeated (*) Vercingetorix, in *Commentaries on the Gallic War*, and he also won the Battle of Pharsalus to defeat Pompey. For ten points, identify this Roman dictator who was assassinated on the Ides of March.

ANSWER: Gaius Julius Caesar (prompt on “Caesar”)

- (20) A rhyme about counting these figures begins “One for sorrow, two for joy,” and one of them waited for figs to ripen to get water. One of these creatures turned himself into a speck of dust to make a woman pregnant, and later found people in a sea shell. Three-legged versions of this animal include the Sanzuwu, who is said to reside within the sun, and the Yatagarasu. Morrigan assumed this form after Cu Chulainn’s death. (*) Odin had two of these, Huginn and Muninn, and Apollo punished Ischys by turning this bird’s feathers black. For ten points, name this bird often seen as a North American trickster.

ANSWER: crow or raven (accept magpie before “three”, prompt on “bird”)

- (21) In one story by this author, the grandmother shows up in person to prove that she’s not dead and that the General won’t be getting money when she is. In another story by this author, the main character is told “I love you so, because you haven’t fallen in love with me” by Nastenka. This author of *The Gambler* and *White Nights* included the “Apropos of the Wet Snow” in a novel that begins “I am a sick man. I am a spiteful man.” This author of (*) *Notes from the Underground* saw Ivan tell the Parable of the Grand Inquisitor in a work that includes Alyosha and Smerdyakoov, and also wrote about the pawnbroker Raskolnikov. For ten points, identify this author of *The Brothers Karamazov* and *Crime and Punishment*.

ANSWER: Fyodor Mikhailovich Dostoyevsky

Bonuses

- (1) It opens with Elder Price practicing at the Missionary Training Center in the song *Hello!*. For ten points each:

[10] Identify this musical in which Elders Price and Cunningham travel to Uganda to convert the locals to the titular religion. It won its writers, Trey Parker, Matt Stone, and Robert Lopez, the 2011 Tony Award for Best Musical.

ANSWER: The Book of Mormon

[10] The song *All-American Prophet* from *The Book of Mormon* tells the story of this “American Moses”, who proclaimed “I speak to God all the time, And he told me to head west!” after receiving the sacred golden plates.

ANSWER: Joseph Smith

[10] In this song from *The Book of Mormon*, Elder Price reaffirms his faith that “God lives on a planet called Kolob” and that the “Garden of Eden was in Jackson County, Missouri”.

ANSWER: I Believe

- (2) It’s not that important to have a qualified vice-president. For ten points each:

[10] After a divisive 1960 primary, John F. Kennedy picked this Texan as his running mate to balance the ticket. Kennedy didn’t want to pick this man, but Speaker Sam Rayburn pressured him to.

ANSWER: Lyndon B. Johnson (or LBJ)

[10] This man became president without being elected president or vice-president. His predecessor as vice-president, Spiro Agnew, resigned during a scandal about taking bribes while Governor of Maryland.

ANSWER: Gerald Ford

[10] John Garner was succeeded as vice-president by a man with this last name, who was ultimately considered too liberal and replaced on the ticket by Harry Truman in the next election. Another man with this last name promised, “segregation now, segregation tomorrow, segregation forever.”

ANSWER: Wallace

- (3) One character with this name worries that the karaka-trees will be hidden by a marquee but comments on how “very nice” workmen are. For ten points each:
 [10] Name the protagonist of Katherine Mansfield’s *The Garden Party*. Another person with this name met a writer on Good Friday, and was alleged to have died on Good Friday too.
ANSWER: Laura
 [10] Laura is the dedicatee of this collection of sonnets, which addressed her as “You who hear the sound in scattered rhymes”.
ANSWER: Il Canzoniere (or Songbook)
 [10] This Italian author wrote *Il Canzoniere* and an epic about Scipio’s victory over Hannibal, *Africa*. He is also the namesake of a certain type of sonnet.
ANSWER: Petrarch (or Francesco Petrarca)
- (4) The Fischer variety of their namesake synthesis makes use of a sulfuric acid catalyst to generate an electrophile. For ten points each:
 [10] Name this class of organic molecules, which are formed by the reaction of an alcohol with a carboxylic acid. They often lend their sweet or pleasant smells to fruits and plants.
ANSWER: esters
 [10] Under acidic conditions, esters decompose back into alcohols and carboxylic acids in this general type of reaction. ATP undergoes this type of reaction when splitting into AMP and pyrophosphate.
ANSWER: hydrolysis
 [10] Hydrolysis splits polysaccharides into monosaccharides along their glycosidic bonds, which consist of an atom of this element connecting each of the two sugar ring structures.
ANSWER: oxygen (prompt on “O”)
- (5) Identify the following about Jewish sacrifices for ten points each.
 [10] This patriarch’s father, Abraham, almost sacrificed him, but stopped when an angel told him to, and a ram was sacrificed in his place instead. By the time he returned to the base of the mountain, his mother, Sarah, had already died.
ANSWER: Yitzhak (or Isaac)
 [10] Aaron selected two of these animals, offered one as a sin offering for God, and sent the other into the wilderness. A male one was supposed to be offered every Yom Kippur.
ANSWER: goat (accept azaze or scapegoat)
 [10] Aaron also built this idol while in the desert; Moses became so angry upon seeing it that he ground it to powder and forced the Israelites to ingest it.
ANSWER: Golden Calf

- (6) He put down the Free Aceh Movement, and a unanimous referendum among 1,022 chiefs in his nation's easternmost province called his rule into scrutiny. For ten points each:
 [10] Name this second president of a southeast Asian nation who gained power in a military coup. His Order Baru, or "New Order", replaced his predecessor's "Guided Democracy".
ANSWER: Suharto
 [10] Suharto and his predecessor Sukarno were both presidents of this majority Muslim nation with capital at Jakarta. Large islands in this nation include Borneo, Sumatra, and Java.
ANSWER: Indonesia
 [10] Indonesia launched an invasion of this small nation on its southern border when it received independence from Portugal. After Suharto's resignation, the country voted for independence in a U.N.-sponsored referendum.
ANSWER: East Timor (or Timor-Leste)
- (7) These only exist between sets with the same cardinality. For ten points each:
 [10] Identify this type of function which is both one-to-one and onto.
ANSWER: bijection (accept one-to-one correspondence or bijective function)
 [10] This is the term for a bijection from a set to itself, since such a function essentially just rearranges the set's elements. This word is synonymous with reordering.
ANSWER: permutation
 [10] This function counts the number of permutations of an n -element set. The product of all integers from 1 to n , this function is represented with an exclamation point.
ANSWER: factorial
- (8) This process can be done extremely simply in an apparatus designed by Philo Farnsworth. For ten points each:
 [10] Name this process done in the CNO cycle that provides a star's energy source. In this process, two atoms combine to form a larger one, releasing energy.
ANSWER: nuclear fusion
 [10] One test of this doubly-eponymous nuclear bomb design, Castle Bravo, worked much better than expected. It uses a small fission device to start a larger fusion reaction.
ANSWER: Teller-Ulam design
 [10] The Hoyle state describes how this most common isotope of carbon is formed by stellar fusion, enabling life.
ANSWER: Carbon-12 (or C-12)

- (9) It opens with Zany killing Colonel Jose Parrales, but the murder is blamed on General Canales, prompting Lucio Vasquez's horror when Zany is shot. For ten points each:
 [10] Identify this novel in which Miguel Angel Face falls in love and marries Camilla, but dies in a jail cell without ever seeing their son.
ANSWER: El Señor Presidente
 [10] *El Señor Presidente* is a work by this author who wrote about the C.I.A.-backed overthrow of Jacobo Arbenz in *Weekend in Guatemala*.
ANSWER: Miguel Angel Asturias
 [10] Asturias won the Lenin Peace Prize for a trilogy named for this type of fruit. O. Henry described the Republic of Anchuria as this type of republic.
ANSWER: banana
- (10) After Dancaire and Remendado leave Lillas Pastia's inn, Don Jose shows up to sing the *Flower Song* to the main character. For ten points each:
 [10] Identify this opera in which Escamillo sings the *Toreador Song* and the titular Spanish gypsy works at a cigarette factory.
ANSWER: Carmen
 [10] *Carmen* is a work by this French composer, who also wrote about Nadir, Zurga, and Leila in *The Pearl Fishers*.
ANSWER: Georges Bizet
 [10] Georges Bizet also wrote the incidental music to this Alphonse Daudet play. He later rearranged that music into two four-movement pieces with this name.
ANSWER: L'Arlésienne (or The Girl from Arles)
- (11) Some atmospheric gases are playing a great role in accelerating anthropogenic global warming. For ten points each:
 [10] This greenhouse gas is excreted by ruminants such as cattle. Its storage in melting permafrost has the potential to cause a warming feedback loop.
ANSWER: methane (or CH4)
 [10] This other greenhouse gas is probably the biggest contributor to climate change, as it is the main result of combustion of fossil fuels. It is drawn down by the deep ocean, with an unfortunate side effect of ocean acidification.
ANSWER: carbon dioxide (or CO2)
 [10] This scientist measured CO2 levels at Mauna Loa. His eponymous curve shows their continuing increase.
ANSWER: Charles Keeling (or Keeling curve)

- (12) “I vowed that I would dedicate my powers to thee and thine- have I not kept the vow?” For ten points each:
 [10] Identify this poem, which begins by describing the title entity as “the awful shadow of some unseen Power” which “Floats though unseen among us.”
ANSWER: Hymn to Intellectual Beauty
 [10] This poem by the author of *Hymn to Intellectual Beauty* compares the title bird to “poet hidden in the line of thought,” asks it to “Teach me half the gladness thy brain must know,” and begins “Hail to thee, blithe spirit!”
ANSWER: Ode To a Skylark
 [10] This poet of *Hymn to Intellectual Beauty* and *Ode to a Skylark* wrote about the “breath of Autumn’s Being” in *Ode to the West Wind*.
ANSWER: Percy Bysshe Shelley
- (13) This event is preceded by three consecutive winters and is heralded by Heimdall blowing the Gjallarhorn. For ten points each:
 [10] Name this world-ending war of Norse mythology.
ANSWER: Ragnarok
 [10] Thor kills and is killed by this monster at Ragnarok. He had earlier attempted to lift this monster thinking it was a cat, and this monster encircles the realm of humanity.
ANSWER: Midgard Serpent (or Jormungandr)
 [10] This god, one of the few to survive Ragnarok, was born of the giantess Rindr and avenges his brother Balder by murdering Hodr the day after this god is born.
ANSWER: Vali
- (14) The signal for this event was the playing of the song *E Depois do Adeus* over the radio. For ten points each:
 [10] Name this coup led by António de Spínola against Marcelo Caetano. Despite public announcements by the Movement of the Armed Forces to stay inside, people showered the streets with the namesake flowers.
ANSWER: Carnation Revolution
 [10] The Carnation Revolution overthrew Marcelo Caetano, the successor of this long-serving dictator, whose Estado Novo refused to give independence to colonies such as Angola and Mozambique.
ANSWER: Antonio de Oliveira Salazar
 [10] The fall of the Estado Novo in this country led to a democratic transition in its neighbor Spain.
ANSWER: Portugal (or Portugese Republic)

- (15) The highest point in this archipelago is Mount Darwin. For ten points each:
- [10] Name this island group in southern South America shared by Chile and Argentina and separated from the mainland by the Strait of Magellan.
- ANSWER:** Tierra del Fuego
- [10] This most populous city in Tierra del Fuego is located on the banks of the Beagle Channel and is sometimes regarded as the southernmost city in the world.
- ANSWER:** Ushuia
- [10] This body of water south of the Tierra del Fuego archipelago connects the Atlantic and Pacific Oceans and is named for an Englishman who was the second man to circumnavigate the globe.
- ANSWER:** Drake Passage
- (16) He painted his most famous work into a scene with three nude women in his *The Models*. For ten points each:
- [10] Name this pointillist artist who depicted men in top hats and women with umbrellas as well as dogs and a monkey overlooking the water in *A Sunday Afternoon on the Island of La Grande Jatte*.
- ANSWER:** Georges Seurat
- [10] Seurat co-developed the pointillist style with this artist of *The Port of Saint-Tropez* and *Portrait of Félix Fénéon*.
- ANSWER:** Paul Signac
- [10] Similar to pointillism is the use of BenDay dots, most notably employed by this pop-artist of *Drowning Girl*, *Whaam!*, and *Look Mickey*.
- ANSWER:** Roy Lichtenstein
- (17) The primary components for the final product of this process are aggregates of fibrin. For ten points each:
- [10] Name this process which sees a positive feedback loop of thrombin production, eventually leading to the formation of its namesake thrombus.
- ANSWER:** blood clotting (or blood coagulation)
- [10] Also known as phyloquinone, this molecule aids in conversion of glutamic acid to a molecule known as Gla, which aids in clotting.
- ANSWER:** Vitamin K
- [10] These cells, which do not contain nuclei, aid in blood clotting by becoming sticky and adhering to each other. In addition to the fibrin clot, these cells lead to the formation of a white clot.
- ANSWER:** platelets

- (18) The first of these titled *On the Bank Crisis* attempted to prevent bank runs. For ten points each:

[10] Identify these radio speeches delivered by Franklin D. Roosevelt to the American people. Thirty of these addresses were given, many opening “Good evening, friends.”

ANSWER: Fireside Chats

[10] The second fireside chat outlined this economic recovery program, describing its Civilian Conservation Corps, Farm Relief Bill, and public works projects.

ANSWER: New Deal

[10] One of the last of the fireside chats discussed the conference in this city. Roosevelt met with Stalin and Churchill in this city to plan the D-Day invasion.

ANSWER: Tehran

- (19) “Give me your tired, your poor, your huddled masses yearning to breathe free.” For ten points each:

[10] Identify this poem, named for a different kind of wonder of the ancient world. It concludes by requesting “Send these, the homeless, tempest-tost to me. I lift my lamp beside the golden door.”

ANSWER: The New Colossus

[10] *The New Colossus* is a work by this Jewish-American poet, who also wrote *Song of a Semite*.

ANSWER: Emma Lazarus

[10] *The New Colossus* was written for and is inscribed inside this American monument. Lazarus describes it, quite accurately, as “A mighty woman with a torch.”

ANSWER: Statue of Liberty (or Liberty Enlightening the World)

- (20) Answer the following about Spanish architecture for ten points each.

[10] The Puente de Alcantara is a Medieval arch bridge spanning the Tagus River in this Castilian city. It appeared at the bottom of El Greco’s *View of [this city]*.

ANSWER: Toledo

[10] This architect from Barcelona designed that city’s Park Guell in addition to his most famous work, a Gothic revival church under construction since 1882, La Sagrada Familia.

ANSWER: Antoni Gaudi

[10] This “red fortress” of Grenada is home to the Court of the Myrtles and the Court of the Lions and features ceilings decorated in arabesques.

ANSWER: Alhambra

- (21) Photorespiration usually occurs after they close due to dry conditions. For ten points each:
[10] Name these openings in leaf and stem epidermal layers which play a role in transpiration and gas exchange.

ANSWER: stomata

- [10] Stomata are bordered by two of these specialized cells which control the size of the pore by regulating turgor pressure.

ANSWER: guard cells

- [10] Guard cells play an important role in determining whether stomata open or close by controlling the concentration of this ion, which can be released internally from their vacuoles or from depolarization of the plasma membrane.

ANSWER: potassium (or K-plus)