



The Illinois Mathematics and Science Academy of Aurora, IL presents

# IMSANITY 4

## -ROUND 6-

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## Tossups

- (1) This writer claimed that “the high column and the green laurel are broken” in a work lamenting the death of Cardinal Giovanni Colonna. This author wrote a work of biographies, including those of Hannibal, Julius Caesar, and a figure who is described in another work as “famous for his valor and dreadful in war.” This author of *On Illustrious Men* and biographer of(\*) Scipio compared his love for a woman whom he met on Good Friday to that of Apollo for Daphne in a work addressed to “You who hear the sound, in scattered rhymes.” For ten points, identify this humanist who dedicated his *Canzoniere* to Laura and who is the namesake of a type of sonnet.

ANSWER: Petrarch (or Francisco Petrarca)

- (2) This function of  $x$  is equal to one minus  $\text{ver}(x)$  [READ: “vurr of  $x$ ”]. One-half of the quantity of  $e$  to the  $x$  plus  $e$  to the negative  $x$  is the hyperbolic form of this function. This function is used to compute the real part of  $e$  to a complex power in Euler’s Formula. Twice the square of this function minus one gives this function of  $2x$  according to one of its(\*) double-angle formulas. The range of the inverse of this function is from 0 to  $\pi$ , and this function decreases from 1 to  $-1$  on that interval. It gives the  $x$ -coordinate of a point on the unit circle. For ten points, identify this function equal to the adjacent side over the hypotenuse and often contrasted with sine.

ANSWER: cosine

- (3) In this court case, the ruling of *Briggs v. Elliot* was unsettled and the ruling of *Gebhart v. Belton* was upheld. A precedent about “intangible qualities” was cited in this case from *Sweatt v. Painter*. Testimony from Hugh Speer in this case concerned messages of inferiority, and its majority opinion noted that “tangible” equalities were inadequate and was written by(\*) Earl Warren. Thurgood Marshall successfully argued against the “separate but equal” doctrine and *Plessy v. Ferguson* was overturned. For ten points, name this Supreme Court case that found segregation of public schools unconstitutional.

ANSWER: Brown v. Board of Education of Topeka, Kansas (accept in either order)

- (4) This phenomenon is the namesake of a type of intense kilometric radiation that was studied by the Cluster missions. The THEMIS spacecraft is currently studying this phenomenon, and the Visible Imaging System is part of the POLAR spacecraft designed to study these events. These events were named by Pierre Gassendi, and their most common variants involve oxygen and nitrogen emissions. Their intensity increases during(\*) geomagnetic storms, and they are caused by the interactions of charged particles in the upper atmosphere. For ten points, name these colorful phenomena which come in australis and borealis varieties.

ANSWER: aurorae or auroras (accept more specific answers like aurora borealis or aurora australis)

- (5) One of this artist's earlier works is *Head of a Skeleton with a Burning Cigarette*. This artist created a portrait with Japanese and impressionist paintings in the background in one of his three depictions Pere Tanguy. This man's *The Yellow House* showed the exterior of a building whose interior he painted in(\*) *Bedroom at Arles*. He depicted five peasants sitting for a meal in *The Potato Eaters*, but his most famous work, painted from his room in Saint-Remy, features several cypress trees underneath the swirling sky. For ten points, name this Dutch artist of *Starry Night*.

ANSWER: Vincent van Gogh

- (6) This author wrote "My house was called / the house of flowers, because in every cranny / geraniums burst" in his poem *I'm Explaining a Few Things*. He said the sea of death attained him "like a gallop of twilight / the comprehensive mathematics of the dark," and in another poem wrote "cemetery of kisses, there is still fire in your tombs." He wrote(\*) "In you everything sank" in a poem which began "the memory of you emerges from the night around me." That poem helped title a collection which included *Tonight I can Write the Saddest Lines*. The author of *Canto General* is, for ten points, this Chilean author of *Twenty Love Poems and a Song of Despair*.

ANSWER: Pablo Neruda (or Neftali Ricardo Reyes Basoalto)

- (7) Members of this faith use the word "Syad" to mean "maybe", and the parable of the blind men and the elephant exemplifies this religion's concept of many viewpoints called *anekantavada*. Monks in this religion follow the rules set in the *Cheda*, and members of this faith believe in sixty-three illustrious beings known as *Salakapurusas*. Represented by a hand with a wheel on its palm, this religion includes the sects of the(\*) "sky-clad" *Digambara*, which shuns clothing, and the "white-clad" *Svetambara*. Some members of this faith cover their mouth in practicing *ahimsa*. For ten points, name this pacifist Indian faith founded by Mahavira.

ANSWER: Jainism (also accept Jain Dharma)

- (8) The Namib desert is home to the *Welwitschia* genus in this class of organisms, which also includes an organism that produces the decongestant ephedrine. Another genus in this group is unique in having vessel elements in its xylem. The genus *Archaeopteris* was the evolutionary ancestor of this present-day group of organisms, which include the phylum *Gnetophyta* and another with only one species,(\*) *Ginkgo biloba*. These plants generally have sporangia packed in strobili, and their seeds are not enclosed in ovaries. For ten points, name this group of plants that include the sequoia and other conifer trees, contrasted with angiosperms.

ANSWER: gymnosperms

- (9) **One mountain on this island has the world's steepest purely vertical drop in its Auyuittuq National Park. The aforementioned Mount Thor and Mount Asgard are in this island's namesake mountain range. The eastern shore of this island is indented by the Cumberland sound, and the Foxe Basin separates the Melville Peninsula from this island, which is located west of the Davis Strait and south of a namesake(\*) Bay. Frobisher Bay is the site of this island's largest city, Iqaluit. Located to the north of the Hudson Strait in Nunavut is, for ten points, this fifth-largest island in the world, the largest in Canada.**

**ANSWER:** Baffin Island

- (10) **This name belonged to a man who tried to annul his marriage to Ingeborg, a sister of Canute IV, and gained the territories in the Treaty of Le Goulet. Another man with this name noted "I inherited, I bought, I conquered" after succeeding Sebastian I. A man of this name was opposed by Demosthenes's alliance called the Hellenistic League, while another created a "Holy League" that won the(\*) Battle of Lepanto. This name is shared by a man who crushed King John's territorial ambitions and the man who organized the Corinthian League. For ten points, give this name shared by the father of Alexander the Great and the king who sent the Spanish Armada.**

**ANSWER:** Philip II of Macedon or Spain or France (accept Philip I of Portugal, Philip Augustus, or Philippe Auguste, accept forms like "Felipe" or "Phillipe" for "Philip", prompt on "Philip")

- (11) **According to the *Metamorphoses*, when Zeus fought Typhon, this figure turned into an ox. This figure fathered Eukleia, Eupheme, and Euthenia with the Kharite Aglaia, and he brought tragedy upon many Theban women after gifting the Necklace of Harmonia. Either Prometheus or this god struck Zeus with an axe to bring on the birth of Athena. He works in(\*) Mount Etna, and he landed on the island Lemnos after being thrown from Mount Olympus. He created a metal net to catch his wife and Ares together. For ten points, name this Greek god, the husband of Aphrodite and the god of the forge.**

**ANSWER:** Hephaestus (or Hephaistos, do NOT prompt on or accept "Vulcan")

- (12) **A cat's-whisker detector consists of a thin wire touching this kind of material, which is also found in quantum dots. A lack of phonon emissions characterizes an indirect band gap in these materials, sometimes the location of depletion regions. These materials are subject to a process that involves the addition of elements such as boron or gallium to introduce additional energy states in the band gap; that process is called(\*) doping. Popular examples of these materials include zinc oxide and gallium arsenide, although most electronic devices use silicon-based ones. For ten points, name these devices with a conductivity between that of an insulator and conductor.**

**ANSWER:** semiconductors

- (13) This man employed the ambassador Nabonidus and took over Syria and Phoenicia after a victory at the Battle of Carchemish. According to the historian Berossus, this ruler predicted the fall of his empire, and he was succeeded by Amel-Marduk. This ruler is credited with restoring the Lake of Sippar, and he inscribed how he “laid the foundations of the gates down to the ground water” on the(\*) Ishtar Gate. He may be best known for a monument he made for his homesick wife, Amytis of Media. For ten points, name this ruler, the son of Nabopolassar who built the Hanging Gardens of Babylon.

ANSWER: Nebuchadnezzar II ( accept Nebuchadrezzar II)

- (14) One character created by this author read only the Baronetage, his copy of which included handwritten notes about his son-in-law and wife’s death. In another novel by this author, rehearsals for Elizabeth Inchbald’s play *Lovers’ Vows* end suddenly when Sir Thomas returns home. In one novel, Frederick Wentworth marries Anne Elliot eight years after his original proposal, and in another, Maria runs off with Henry Crawford, and(\*) Edmund Bertram and Fanny Price marry. The author of *Persuasion* and *Mansfield Park*, for ten points, identify this author who wrote about Elizabeth Bennet and her sisters in *Pride and Prejudice*.

ANSWER: Jane Austen

- (15) Cornelius Nepos wrote a biography of a follower of this school of philosophy named Titus Pomponius Atticus. This school’s founder wrote letters to his pupils Pythocles and Herodotus, and eighty of his maxims appear in the Vatican sayings. This school, whose members included Metrodorus of Lampsacus the Younger, advocated the attainment of(\*) ataraxia, and it was centered around “The Garden”. Its ideas were explored in the Latin poem *On the Nature of Things* by Lucretius. For ten points, name this Greek school of philosophy, opposed to Stoicism, whose followers sought liberation from pain in order to attain the greatest happiness.

ANSWER: Epicureanism

- (16) This author wrote about “murmurs of pleasures and pains and wrongs / The sound of winged words” in the title poem of his collection *Birds of Passage*. This author wrote that “Art is long, and Time is fleeting” and “Life is real! Life is earnest!” in his *A Psalm of Life*, and he wrote a poem about his late wife titled *The Cross of Snow*. He wrote about a love triangle between John Alden, Priscilla Mullins, and the title(\*) Miles Standish. This man wrote of Minnehaha “by the shores of Gitchee Gumee”, and another poem featured lanterns hung “one if by land and two if by sea”. For ten points, identify this author of *Song of Hiawatha* and *Paul Revere’s Ride*.

ANSWER: Henry Wadsworth Longfellow

- (17) This compound is the only chemical not recycled in the sulfur-iodine cycle, and four- and five-site molecular models of it are known as the Bernal-Fowler and TIP5P [READ: “tip five pee”] models, respectively. Samples of this compound exist in an autolysis equilibrium, and its solid-liquid phase boundary has a positive(\*) slope. Gaseous products are often said to be collected over this substance, which is commonly distributed in 55.5 molar concentration. Complete combustion releases this compound and carbon dioxide as products. For ten points, name this universal solvent also known as dihydrogen monoxide or H<sub>2</sub>O.

ANSWER: water (accept H<sub>2</sub>O or dihydrogen monoxide before mention)

- (18) The diamond-smuggling Al Capone is the only real-life individual to appear as a villain to this character, who is the protagonist of *King Ottokar's Sceptre* and *Cigars of the Pharaoh*. In another work, this figure and Tharkey search for Chang Chong-Chen but run into a yeti while in Tibet. This character travels to(\*) Bagghar to prevent Sakharine from taking the third model of the Unicorn in a recent film. This character's companions include Captain Haddock and his white Scottish terrier, Snowy. For ten points, identify this animated character created by Hergé, a young Belgian reporter.

ANSWER: Tintin

- (19) This country saw a post office occupied during the creation of a failed breakaway state, the Republic of Ploiesti. The Monstrous Coalition brought down the first leader of this country, Alexander Cuza, and the Codreanu trials occurred here. One king of this nation was preceded and succeeded by his son Michael I; that king was Carol II. The last execution in this nation took place on Christmas Day in 1989 and was partially(\*) televised. This nation gained Transylvania in the Treaty of Versailles, and it was formed from the regions of Moldavia and Wallachia. For ten points, name this country led by Ion Antonescu and Nicolae Ceausescu from Bucharest.

ANSWER: Romania (accept Kingdom of Romania)

- (20) This composer dedicated a work to violinist Diaz Albertini which makes use of the habanera theme. Another of this composer's works for violin and orchestra opens with an arpeggiating violin solo in A minor and later features the violin playing in 2/4 time over an orchestra playing in 6/8. This composer of *Havanaise* and *Introduction and Rondo Capriccioso* used twelve D notes on a harp to open a work which uses the(\*) xylophone to imitate the sound of rattling bones. Another work by this composer includes movements like *Personages with Long Ears*, *Fossils*, and *The Swan*. For ten points, identify this composer of *Danse Macabre* and *Carnival of the Animals*.

ANSWER: Charles-Camille Saint-Saëns

- (21) The largest of these shapes that can pass through another is named for Prince Rupert. This shape has Schläfli symbol  $\{4, 3\}$  [READ: “Four Three”]. When this shape is truncated, the resulting object has six hexagonal and eight triangular faces. The only space-filling regular tiling of three-dimensional space makes use of this shape. The Delian problem concerned this shape, seeking to double its<sup>(\*)</sup> volume using a compass and straightedge. The dual of the octahedron, this shape has twelve edges and eight vertices as is sometimes called a regular hexahedron. For ten points, name this three-dimensional shape with six square faces.

**ANSWER:** cube (accept regular hexahedron before mention)

## Bonuses

- (1) In addition to having a pretty high crime rate, Chicago also has some pretty cool architecture. For ten points each:
- [10] This Director of Works for the 1893 World's Columbian Exposition designed the Flat Iron Building and the Monadnock Building in Chicago, although his Flatiron Building in New York City is more recognizable.  
**ANSWER:** Daniel Hudson Burnham
- [10] This Prairie School architect designed Chicago's Robie House in addition to a house for Edgar Kaufmann called Fallingwater.  
**ANSWER:** Frank Lloyd Wright
- [10] The Illinois Institute of Technology's Crown Hall was designed by this proponent of the "Second Chicago School". This man also served as the last director of the Bauhaus and designed the Farnsworth House sixty miles outside Chicago.  
**ANSWER:** Ludwig Mies van der Rohe (prompt on "van der Rohe")
- (2) This state was once represented in Congress by the Copperhead leader Clement Vallandigham and "Mr. Republic", Robert Taft. For ten points each:
- [10] Name this state, the easternmost and first created from the Northwest Territory. Dollree Mapp brought suit against this state on grounds that it had illegally searched her home in Cleveland.  
**ANSWER:** Ohio
- [10] Ohio fought a boundary dispute with its northern neighbor during this 1835 to 1836 war, which saw boundaries set by the Fulton and the Harris Lines. Members of the namesake strip of land chose to join Ohio.  
**ANSWER:** Toledo War (also accept Michigan-Ohio War)
- [10] In 1970, the National Guard opened fire on students protesting of the Vietnam War at this Ohio University. Four students were killed.  
**ANSWER:** Kent State University
- (3) At the end of this work, some characters perform a play in which they act as the Worthies Hector, Pompey, Alexander, Hercules, and Judas Maccabeus. For ten points each:
- [10] Identify this play in which Ferdinand, Berowne, Dumain, and Longaville swear to devote three years to study, but promptly ruin those plans by falling in love with the Princess of France, Rosaline, Katharine, and Maria.  
**ANSWER:** Love's Labours Lost
- [10] *Love's Labours Lost* was unusual for Shakespeare's comedies because it did not end with any of these events. In *The Merry Wives of Windsor*, Caius performs this action with a young boy he assumes is Anne, while more traditionally, Anne does this with Fenton. *Twelfth Night* ended with one of these events between Viola and the Duke.  
**ANSWER:** marriage (accept clear-knowledge equivalents like wedding)
- [10] Shakespeare's comedies were also notable for their frequent use of this device, most notably exemplified by Rosalind and Ganymede in *As You Like It*, though Viola in *Twelfth Night* took this action.  
**ANSWER:** crossdressing (accept dressing as a man or any clear-knowledge equivalent)



- (4) This man composed the *Froissart Overture* and *In the South Overtures*. For ten points each:  
 [10] Identify this composer of *Introduction and Allegro* who used a Cardinal Newman poem as the basis for an oratorio about the title figure's death.  
**ANSWER:** Sir Edward Elgar  
 [10] The eleventh piece in this Elgar work concerns about a bulldog who jumps into the River Wye and is called *G. R. S.* The thirteenth piece in this collection quotes Mendelssohn's *Calm Sea and Prosperous Voyage*, and all fourteen pieces concern a "hidden theme".  
**ANSWER:** Enigma Variations (accept Variations on an Original Theme for Orchestra, Opus 36)  
 [10] The Trio section *Land of Hope and Glory* in this Elgar work is often played at graduation ceremonies in the United States.  
**ANSWER:** Pomp and Circumstance Marches
- (5) In a certain formula, this value is equal to  $b$  squared minus  $4ac$ . For ten points each:  
 [10] Identify this value for a polynomial, which is a multiple of the product squared of the distances between its roots. Whether this value is positive or negative tells how many real and complex roots its polynomial has.  
**ANSWER:** discriminant  
 [10] The discriminant is equal to  $b$  squared minus  $4ac$  for this type of polynomial, where it appears under a square root in a namesake formula.  
**ANSWER:** quadratic (accept degree 2 or equivalents)  
 [10] The discriminant cannot determine the exact number of complex roots for polynomials with this degree or higher. Niels Henrik Abel proved that this is the largest degree of a polynomial which can always be solved in radicals.  
**ANSWER:** four
- (6) He reportedly stated "My God, have mercy on me and on my poor people" while being assassinated by Balthasar Gerard. For ten points each:  
 [10] Name this first Prince of the house of Orange-Nassau. He led the Dutch revolt against the Spanish in the Eighty Years' War.  
**ANSWER:** William I of Orange (accept William the Silent or "Willem" for "William", prompt on "William" of Orange)  
 [10] Another member of the house of Orange, William III, came to power in England during this period. This period saw James II exiled to Ireland.  
**ANSWER:** Glorious Revolution (accept Bloodless Revolution)  
 [10] Dutch settlers maintained their Orange allegiance when they created the Orange Free State. These people, who went on the Great Trek to the Orange Free State, fought the Zulus in the Battle of Blood River.  
**ANSWER:** Voortrekkers (accept Boers)

- (7) This figure was once mistaken for Hermes after healing a lame man in Lystra. For ten points each:  
 [10] Name this resident of Tarsus, an apostle under Jesus who undertook many missionary trips. He converted after being temporarily blinded while traveling to Damascus  
**ANSWER:** Saint Paul the Apostle (also accept Saul of Tarsus)  
 [10] Paul wrote this work, the first epistle of the New Testament, which included the verse 3:23, “For all have sinned and fall short of the glory of God.” It also noted that “the gift of God is eternal life”.  
**ANSWER:** Epistle of Paul to the Romans  
 [10] One famous commentary on Paul’s *Epistle to the Romans* was written by this Swiss Theologian, who later went on to write to criticize Nazi-supporting Christians in the Barmen Declaration.  
**ANSWER:** Karl Barth
- (8) Its equation is  $1$  over the square root of  $2\pi$  times  $e$  to the minus  $x$  squared over two. For ten points each:  
 [10] Name this bell-shaped curve studied in statistics. The Central Limit Theorem states that the mean of independent random variables is distributed according to this curve, and  $z$ -scores are used to compute positions on it.  
**ANSWER:** standard normal curve or Gaussian curve (accept “distribution” in place of “curve”)  
 [10] The sum of the squares of normal random variables follows this distribution, which can be used to construct confidence intervals for the standard deviation from a sample, or to test for differences in categorical data.  
**ANSWER:** chi-squared distribution  
 [10] When the standard deviation is unknown, this distribution can be used to estimate the mean. Developed under the pseudonym Student, its values measure the number of sample standard deviations the data is from the mean.  
**ANSWER:** Student t-distribution (accept t-test)
- (9) One character in this play places a three-volume manuscript in a perambulator and abandons a child in a handbag in a cloak-room of a railway station. For ten points each:  
 [10] Identify this play in which Algernon Moncrieff and Jack Worthing both pretend to share the same first name to court Cecily Cardew and Gwendolen Fairfax.  
**ANSWER:** The Importance of Being Earnest  
 [10] *The Importance of Being Earnest* is a work by this author, whose only novel is *The Picture of Dorian Gray*.  
**ANSWER:** Oscar (Fingal O’Flahertie Wills) Wilde  
 [10] Oscar Wilde also wrote this play in which Lady Cheveley blackmails Robert Chiltern, but does not succeed in either breaking up the Chiltern’s marriage or marrying Lord Goring.  
**ANSWER:** An Ideal Husband

- (10) Answer some questions about the main structural component of a cell, the cytoskeleton.. For ten points each:
- [10] These tension-bearing structures, which play a role in muscle contraction, are composed of two interlacing molecules of actin. Cortical ones are found close to the cell membrane, which contrasts with the less viscous sol state of the cytoplasmic interior.  
**ANSWER:** microfilaments
- [10] These organelles serve as the organizing center for another cytoskeletal macromolecule, the microtubule. Composed of two perpendicularly oriented centrioles, these structures migrate to the opposite poles of a cell during mitosis and give rise to the mitotic spindle.  
**ANSWER:** centrosomes
- [10] This term, coupled with “rescue,” describes the dynamic instability that dissociates the ends of microtubules, which are rapidly shrinking and growing in size.  
**ANSWER:** catastrophe
- (11) In this poem, “The little one sleeps in its cradle... the youngster and the red-faced girl turn aside up the bushy hill” and “The suicide sprawls on the bloody floor of the bedroom.” For ten points each:
- [10] Identify this poem which begins “I celebrate myself” and concludes “I stop somewhere waiting for you.”  
**ANSWER:** Song of Myself
- [10] *Song of Myself* was collected in this poet’s *Leaves of Grass*. He also wrote poems about Abraham Lincoln including *When Lilacs Last in the Dooryard Bloom’d* and *O Captain, My Captain*.  
**ANSWER:** Walter “Walt” Whitman
- [10] Whitman also wrote this poem, set near the Paumanok, where the narrator watches a he-bird and a she-bird, and hears the sea whispering to him “the low and delicious word DEATH.”  
**ANSWER:** Out of the Cradle Endlessly Rocking
- (12) She appeared in the season two finale of *New Girl* as a character who elopes with Shivrang. For ten points each:
- [10] Name this singer whose debut album contained the song *Teardrops on My Guitar*. Her follow-up album, *Fearless*, featured the hits *Love Story* and *You Belong with Me*.  
**ANSWER:** Taylor Swift
- [10] In this song, Swift claims that she knew the title phrase was true “when you walked in”. A remix of this song inserted the sound of goats screaming when the singer exclaims “Oh”.  
**ANSWER:** I Knew You Were Trouble
- [10] *I Knew You Were Trouble* and *We Are Never Getting Back Together* were two songs from this album, Swift’s fourth.  
**ANSWER:** Red

- (13) This painting is noted for its accurately-depicted muscles and tendons, despite being painted in 1632. For ten points each:  
 [10] Name this painting depicting seven bearded men crowding around and watching the titular black-clad physician explore the exposed arm of the cadaver of Aris Kindt.  
**ANSWER:** The Anatomy Lesson of Dr. Nicolaes Tulp  
 [10] This artist of *The Anatomy Lesson* used his wife Saskia as a model for his *Danae*. He is better known for a work displaying the shooting company of Frans Banning Cocq, *The Night Watch*.  
**ANSWER:** Rembrandt Harmenszoon van Rijn (accept either underlined part)  
 [10] In this religious scene painted by Rembrandt, an illuminated Jesus sits with three other men at an empty square table. Caravaggio's depiction of this scene shows Jesus's hand outstretched over the table of food.  
**ANSWER:** Supper at Emmaus
- (14) This war was partially caused by the Thornton Affair. For ten points each:  
 [10] Name this 1846 to 1848 conflict in which James K. Polk invaded the United States' southern neighbor. It was ended by the Treaty of Guadalupe Hidalgo, and its declaration was opposed by the Spot Resolutions.  
**ANSWER:** Mexican-American War  
 [10] Occurring during the Mexican-American War, the Bear Flag Revolt was encouraged by this major known as "pathfinder," who later ran as the first presidential candidate for the newly-created Republican Party.  
**ANSWER:** John C. Fremont  
 [10] Led by Major Jon Riley, this artillery battalion served on the Mexican side during the Mexican-American War. Mainly made up of Irish immigrants and American defectors, it served at the Battle of Monterrey and Buena Vista.  
**ANSWER:** Saint Patrick's Battalion
- (15) This property is only exhibited when all atoms occupy the same quantum state, and fermions are only able to form a state of matter with this property when they are paired up. For ten points each:  
 [10] Identify this property of systems with zero resistance to flow and which do not exhibit any entropy.  
**ANSWER:** superfluidity  
 [10] The most widely-studied superfluid is composed of this element's most stable isotope, whose nucleus is identical to an alpha particle. This noble gas is the second lightest element.  
**ANSWER:** helium (accept He)  
 [10] Helium will behave as a superfluid only when its temperature is lowered below this point, approximately 1.8 degrees Kelvin, when the pressure is at its "upper point."  
**ANSWER:** lambda point

- (16) This empire was opposed by the Champa Kingdom, and it eventually fell to the Ayuthaya kingdom. For ten points each:  
 [10] Name this empire, whose rulers have included the builder of the Bayon Temple, Jayavarman VII, as well as Suryavarman II, the creator of the Angkor Wat.  
**ANSWER:** Khmer Empire  
 [10] The Khmer Empire was located in this modern-day country. The Khmer name was borrowed by a government in this country which instituted killing fields and was led by Pol Pot.  
**ANSWER:** Kingdom of Cambodia (accept Kampuchea)  
 [10] One leader of Cambodia was this U.S.-backed leader who was succeeded by Son Sann. This leader created the Khmer Republic, and was supported by the Sangkum.  
**ANSWER:** Lon Nol
- (17) He wrote about the origin of the narwhal in his study of Inuits titled *The Central Eskimo*. For ten points each:  
 [10] Name this “Father of American Anthropology” and author of *The Mind of Primitive Man* whose students at Columbia University included Alfred L. Kroeber and Claude Levi-Strauss.  
**ANSWER:** Franz Boas  
 [10] Boas studied these ceremonies among the Kwakiutl people which often involved lavish gifts and boasting to assert the host’s social status.  
**ANSWER:** potlatches  
 [10] In *The Mind of Primitive Man*, Boas challenges the idea that achievement is a consequence of this characteristic. Boas’s student Margaret Mead wrote *A Rap on [this characteristic]* with James Baldwin.  
**ANSWER:** race
- (18) Answer the following about panthers in literature for ten points each.  
 [10] This author wrote about a man who dies fasting and is replaced by a panther in *The Hunger Artist*, in addition to writing a novella in which Gregor Samsa becomes a giant insect, *The Metamorphosis*.  
**ANSWER:** Franz Kafka  
 [10] This author connected Sufiya Zinobia with the legend of the white panther in his novel *Shame*. In another novel, Gibreel Farishta and Saladin Chamcha were both on a plane that exploded over the English channel.  
**ANSWER:** Salman Rushdie  
 [10] This author described a panther pacing back and forth behind bars in one poem. Some of his poetry collections include *Sonnets to Orpheus* and *The Duino Elegies*.  
**ANSWER:** Rainer Maria Rilke

- (19) One person sent to spy on this figure, Gelbann, was injured by a golden chess piece thrown into his eye. For ten points each:  
 [10] Name this beautiful woman who was married to the person she hated most, Eogan mac Durthacht. She had the “hair the color of the raven, skin as white as snow, and lips as red as blood”.  
**ANSWER:** Deirdre of the Sorrows (or Derdriu)  
 [10] Deirdre appears in this cycle of mythology. This cycle also tells of Cu Chulainn slaying a guard dog and winning at the Cattle Raid of Cooley.  
**ANSWER:** Ulster cycle  
 [10] The Ulster cycle tells of the mythology of this nation. This nation is also home to the Fenian cycle, which tells of Finn MacCool.  
**ANSWER:** Ireland
- (20) In a Feynman diagram, these particles are represented by a helix. For ten points each:  
 [10] Name this bosonic particle that carries the color charge and mediates the strong force. These particles are exchanged between quarks, and the resulting nuclear force holds together hadrons such as neutrons and protons.  
**ANSWER:** gluons  
 [10] The interaction between quarks and gluons and the color charge is studied as part of this theory. This theory, unlike quantum electrodynamics, consists of three types of charge.  
**ANSWER:** quantum chromodynamics (or QCD)  
 [10] Both QCD and QED are part of this “theory of almost everything” in particle physics. Although it does not explain gravity, this theory does explain the strong, weak, and electrodynamic interactions in its leptons, quarks, and bosons.  
**ANSWER:** Standard Model
- (21) Answer some questions about chanting in Hinduism for ten points each.  
 [10] This god’s “sahasranamam” consists of chanting one thousand of his names, which include Keshava, Narayana, and Krishna, the latter of which is one of this deity’s ten avatars.  
**ANSWER:** Vishnu  
 [10] This ceremony usually involves a saptapadi pooja followed by yajna chant during which the fire god observes. Many versions of this ceremony also involve exchanging garlands.  
**ANSWER:** wedding (or marriage)  
 [10] Nearly every sacred Hindu chanting is preceded by the utterance of this mantra, whose symbol is a universal representation of Hinduism. This one-syllable chant is frequently followed by the word “namah.”  
**ANSWER:** Om