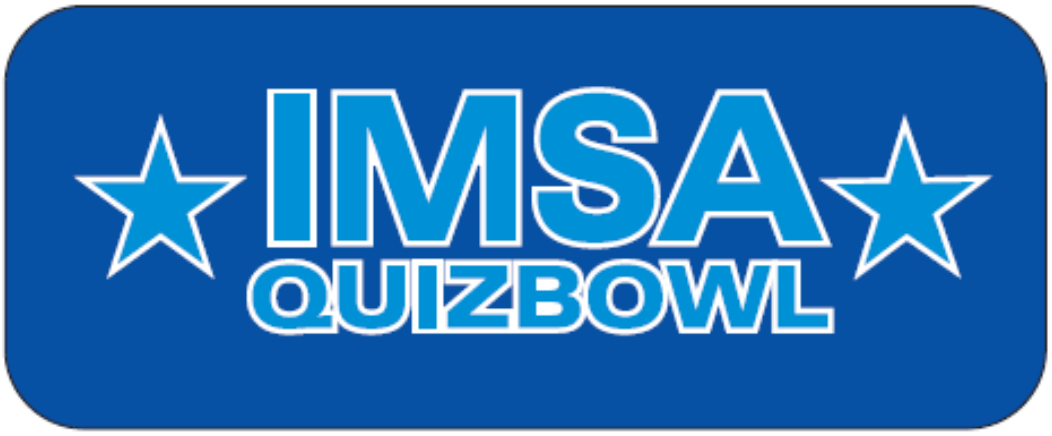

The Illinois Mathematics and Science Academy of Aurora, IL presents

IMSANITY 4

-ROUND 12-

Editors	Writers	
Noah Prince	Waleed Ali	Rajiv Patel-O'Connor
	Willie Chang	Dan Pechi
Sabrina Lato	Lael Costa	Noah Prince
Saieesh Rao	Siva Gangavarapu	Saieesh Rao
	Anton Karpovich	Andrew Salij
	Sabrina Lato	

with special contributions from...
Jonah Greenthal
Eric Ordonez

Tossups

(1) **One poet of this surname described a storm "fast descending," "But a tyrant spell has bound me / And I cannot, cannot go." Another author with this surname created a title character who works for the Bloomfields and Murrays, starts a school, and marries Edward Weston. This surname of the writer of**(*) *Agnes Grey* also belonged to an author who had Nelly Dean tell Mr. Lockwood the story of Thrushcross Grange, Catherine Earnshaw, and Heathcliff, and to another who wrote about Thornfield Manor, Bertha Mason, and Edward Rochester. The authors of *Wuthering Heights* and *Jane Eyre* shared, for ten points, what surname of sisters Anne, Emily, and Charlotte?

ANSWER: Bronte (accept Bell before "Anne" is mentioned)

(2) **By Markov's Inequality, the probability that a random variable exceeds a is at most this quantity divided by a. This quantity of x can be computed as the integral of x with respect to probability. The St. Petersburg Paradox concerns a game in which this quantity is infinite despite finite payouts. The Law of Large Numbers states that the average of the terms of a sequence**(*) approaches this value. In a normal distribution, ninety-five percent of data is within two standard deviations of this value. For a finite data set, this value can be computed by summing the data and dividing by the number of data points. For ten points, name this average value of a data set.

ANSWER: expected value or expectation or mean (prompt on "average")

(3) **This value times the relativistic angular momentum tensor times the permutation symbol times one half equals the Pauli-Lubanski pseudovector. The material derivative is equal to the del operator times the stress tensor plus f in Cauchy's equation for this quantity. This value's quantum mechanical operator equals negative i times h-bar times the gradient operator, and h-bar over two is a lower bound for the product of the standard deviations of this quantity and**(*) position according to Heisenberg's Uncertainty Principle. The time derivative of this quantity is impulse, and Newton's First Law embodies this quantity's conservation. For ten points, identify this quantity equal to mass times velocity.

ANSWER: linear momentum (do not prompt on or accept "angular momentum")

(4) **A village of the Aquascogoc Indians was burned down after they were accused of stealing a silver cup from this settlement. This settlement was first proposed by Sir Humphrey Gilbert, and after he drowned, his half-brother took charge of it. Among the ships sent to this location were the *Roebuck* and the *Tiger*. One of its earliest leaders was John White, the grandfather of the first European child born in the New World,**(*) Virginia Dare. When John White returned to this colony, the word "CROATOAN" was carved on a tree, but all the settlers were missing. For ten points, name this "Lost Colony" in North Carolina led by Sir Walter Raleigh.

ANSWER: Roanoke Island or Roanoke colony

(5) **The "Little" version of this holiday, Katan, is celebrated on leap years, and cities once protected by walls may observe the Meshulash variant of this holiday, which occurs when this holiday coincides with the sabbath. The origin of this holiday is found in the Megillah, in which Bigthan and Teresh fail in their plan to assassinate King Ahasuerus, who decides not to carry out the plans of**(*) Haman, thus sparing Mordecai. For ten points, name this Jewish holiday that commemorates the saving of the Jews from Persia as recalled in the Book of Esther.

ANSWER: Purim

(6) **For a brief period after Maghan II was overthrown, this nation was ruled by Sandaki. Another leader of this nation hired the architect Es-Saheli and was a descendent of Faga Laye. The only leader to abdicate from its throne was Abubakari II, and it was founded after Sumunguru's defeat at the Battle of Kirina to Sundiata. The University of Sankore gained prominence during this empire, whose initial capital was**(*) Niani and which was succeeded by the Songhai empire. For ten points, name this West African empire that included the city of Timbuktu and which was ruled by a leader who took a famously lavish hajj, Mansa Musa.

ANSWER: Mali Empire

(7) **This artist sculpted a headless woman climbing a seashell in *Nude Ascending a Staircase*. This artist created a short film about Chronos with Disney called *Destino*, while another short film by this artist sees a man in nun's uniform bicycling and a woman's eye cut open. In addition to working with Luis Bunuel on *The Andalusian Dog*, this artist included his wife Gala and numerous**(*) Venus de Milo's in his *Hallucinogenic Toreador*. He painted the ground breaking into squares in the *Disintegration of [his most famous work]*, which features ants and soft clocks. For ten points, identify this Spanish Surrealist who painted the *Persistence of Memory*.

ANSWER: Salvador Dali

(8) **This author wrote of Hugh Person meeting with the author R. and goes strangling his love Armande. One of this author's narrators tracked down details of his half-brother's life to correct a biography by Mr. Goodman. This author of *Transparent Things* and *The Real Life of Sebastian Knight* wrote a novel in which Cincinnatus C. is accused of "gnostical turpitude." "I was the shadow of the waxwing slain" began and ended a poem that Charles**(*) Kinbote "commented" on in this author's novel about John Shade, *Pale Fire*. For ten points, identify this author who wrote about the nymphet Dolores Haze and Humbert Humbert in *Lolita*.

ANSWER: Vladimir Vladimirovich Nabokov

(9) **James Stirling wrote that this philosopher "made explicit the concrete Universal that was implicit in Kant" in the book *The Secret of [this philosopher]*. This philosopher discussed the distinction between property and possession in a work divided into the sections *Abstract Right*, *Morality*, and *Ethical Life*; that work is his *Philosophy of Right*. He posits that "becoming" results from a process he termed sublation in his**(*) *Science of Logic*. In his most famous work, he discusses the master-slave relationship and how thesis and antithesis produce synthesis in his dialectic. For ten points, name this idealist German philosopher and author of *Phenomenology of Spirit*.

ANSWER: Georg Wilhelm Friedrich Hegel

(10) **Carl Benedicks published a theory of the four types of this phenomenon, and its enantiotropic variety is visible during temperature and pressure changes. Examples of this phenomenon always occur in the same phase and are systematically named using greek letters. Examples of these substances used in incendiary devices are red and white**(*) phosphorous. Soot and coal are amorphous examples of these substances, which include fullerenes and nanotubes. For ten points, name this phenomenon in which elements exist in multiple physical forms, examples of which for carbon include diamonds and graphite.

ANSWER: allotropy or allotropes

(11) **One story in this novel is interrupted because one character wasn't paying attention to how many of the three hundred fictional goats had crossed a river. At Chrysostom's funeral, Marcela disappears into the woods after saying she had no part in his death. Master Pedro owns a "prophetic" monkey and puts on a puppet show that the main character throws rocks at, and in this novel, Sanson Carrasco pretends to be the**(*) Knight of the White Moon. The title character rides the horse Rocinante, is in love with Dulcinea, and has the squire Sancho Panza. For ten points, identify this novel about a windmill-attacking knight errant by Miguel de Cervantes.

ANSWER: The Ingenious Gentleman Don Quixote of La Mancha

(12) **This man was inspired by Balinese gamelan to write a ballet whose titular figure can transform into a salamander called *Prince of the Pagodas*. In addition to the song cycle *A Birthday Hansel*, he dedicated one work to Audrey Alston and used themes he had written as a child, his *Simple Symphony*. He collaborated with Auden on the operetta *Paul Bunyan* and wrote an opera about a fisherman who is accused of killing his apprentice. His most famous work is based off of a**(*) Henry Purcell work, and he used Wilfred Owen poems in his *War Requiem*. For ten points, name this composer of *Peter Grimes* and the *Young Person's Guide to the Orchestra*.

ANSWER: (Edward) Benjamin Britten (or Baron Britten)

(13) **Steve Young was drafted into a $40 million contract with this city's USFL team, the Express. This city's team won the only championship of the XFL in 2001. The San Diego Chargers played their first season in the AFL in this city, which hosted the first Super Bowl. The 1984 Super Bowl champion team played in this city and later acquired Bo Jackson. Farmers Field in this city may house a future NFL team, as could a renovated**(*) Memorial Coliseum. Having been without an NFL team since 1995 when its Rams and Raiders relocated, for ten points, name this city whose current best football team is the University of Southern California.

ANSWER: Los Angeles, California (accept LA)

(14) **This man launched the unsuccessful Kalmar War against Denmark which ended with the Treaty of Knared. This king obtained the territories of Livonia and Estonia from Poland due to the Treaty of Altmark, and he established the University of Tartu. This man employed Axel Oxenstierna as Lord High Chancellor. He died after being separated from his cavalry at the Battle of**(*) Lutzen, and in the same war, he won against Count Tilly at the Battles of Lech and Breitenfield. For ten points, name this ruler from the house of Vasa known as the "Lion of the North," a famous Swedish King.

ANSWER: Gustavus Adolphus (accept Gustav II Adolf, prompt on "Gustav")

(15) **The gametes of the Chytridiomycota have this structure while other fungi divisions do not. In Arabidopsis, the MAPK receptor family recognizes the protein that makes up this structure, while the receptor for the same proteins in the innate immune system is TLR-5. The orientations of these structures can be characterized as "monotrichous" or "amphitrichous." In bacteria, components of this structure are attached by**(*) four rings, while in eukaryotes they are composed of a 9+2 microtubule arrangement. These structures are composed of a rod, hook, and filament. For ten points, name this cellular structure used in cell motility.

ANSWER: flagellum or flagella

(16) **Lane Kirkland was awarded the Order of the White Eagle for holding a hunger strike supporting this organization, which caused the fall of the Kania regime. This organization sprang from predecessors such as KOR and was influenced by the essay *Theses on Hope and Hopelessness*. This group was invited to discussions with its national government called the**(*) Round Table Talks. The formation of this organization was sparked by the firing of a crane operator, and its founder was an electrician from the Gdansk shipyard. For ten points, name this trade union founded by Lech Walesa which helped end communism in Poland.

ANSWER: Solidarity (or Solidarnosc)

(17) **This deity banished a brother when that brother killed a figure for serving him food out of its mouth. One theory of this deity's creation involved a white-copper mirror, and the dancing of a naked god and a bronze mirror brought this deity out of a cave. This deity made three women from her brother's sword, and this goddess's attendants were killed when her brother threw a**(*) pony into this god's weaving hall. This god was born after her father washed his left eye. For ten points, name this daughter of Izanagi and brother of Susanoo, the sun goddess and chief deity of Shintoism.

ANSWER: Amaterasu

(18) **One character in this novel tries to order lemon coconut chocolate pie, and begins a relationship with a waitress after returning to that restaurant to pay back a nickel. One character is eating toothpaste when he sees the dietician Miss Atkins having an affair, and after she discovers this, she sends him to live with the McEacherns. In this novel, Byron Bunch enlists the help of**(*) Reverend Hightower. Lena Grove is looking for her lover Lucas Burch, who, under the name Joe Brown, is tangled up with the murder of Joanna Burden. For ten points, identify this novel about Joe Christmas written by William Faulkner.

ANSWER: Light in August

(19) **This region is home to Lake Manasarovar, the source of the Karnali River. The Kunlun Mountains are at the northern edge of this region, beyond which sits the Tarim Basin. This region is separated into subregions including Amdo and Kham, and the Karakoram Range marks its southwestern border. Bordered by Xinjiang, this region is the source of the**(*) Mekong and Yellow rivers, and it contains the Potala Palace in its capital city of Lhasa. For ten points, name this region bordered to the south by the Himalayas, a high-altitude plateau in China, sometimes called the "roof of the world."

ANSWER: Tibet (accept Tibetan Plateau or Tibet Autonomous Region)

(20) **Bright red flashes known as sprites and EMPs are created above these features, and hot towers are a tropical variant of them. Mammatus formations typically form on the underside of the incus form of these objects, whose maximum height is limited by the maximum parcel level. Updrafts in these objects can create overshooting tops, a sign of severity. These**(*) anvil-shaped objects are sometimes found at the front of squall lines, and severe ones can form supercells. For ten points, name this largest variety of cloud from which thunderstorms are formed.

ANSWER: cumulonimbus clouds (prompt on "clouds", accept thunderstorms before the end of the first sentence)

(21) **The appearance of the group behind the Hamburg Massacre, the "Red Shirts", influenced voters in this election, and one scandal during it included a bribe from the Union Pacific Railroad exposed by the Mulligan letters. The winning party nominated a man who said of his eventual running mate "I am ashamed to say. Who is Wheeler?". Peter Cooper was on the Greenback Party's ticket in this election, in which contested**(*) electoral votes were distributed in a "corrupt bargain" that brought on the end of Reconstruction. For ten points, name this election in which Samuel Tilden lost to Rutherford B. Hayes.

ANSWER: United States Presidential Election of 1876

Bonuses

(1) In one section of this novel, the narrator implies that Linnaeus is an idiot for suggesting that whales aren't fish. For ten points each:
[10] Identify this novel, which occasionally stops glorifying whaling long enough to describe Queequeg, Ishmael, Ahab, and the title great white whale.
ANSWER: Moby-Dick
[10] *Moby-Dick* is a novel by this author, who wrote about a man who would "prefer not to" in *Bartleby the Scrivener*.
ANSWER: Herman Melville
[10] Herman Melville was more financially successful with this novel, his first, than he was with *Moby Dick*. This novel, subtitled *A Peep at Polynesian Life*. described his time with cannibals on the island of Nukuheva.
ANSWER: Typee

(2) Felix Mendelssohn contributed to the revival of this composer's work by performing his *St. Matthew's Passion*. For ten points each:
[10] Name this composer of *The Goldberg Variations* and *Toccata and Fugue in D Minor* who wrote six pieces for a margrave, *The Brandenburg Concertos*.
ANSWER: Johann Sebastian Bach (prompt on partial answer)
[10] This Bach work, which makes use of circular temperament, consists of two books of preludes and fugues in all twenty-four minor and major keys for solo keyboard.
ANSWER: The Well-Tempered Clavier
[10] Bach's six compositions of this type are sometimes referred to as the *German* Suites. Bach paired three of these works in B minor, D minor and E major along with three Sonatas for solo violin in one work.
ANSWER: partita

(3) This operation is the negation of equivalence. For ten points each:
[10] Identify this operation which is true when exactly one of its input propositions is true.
ANSWER: EXOR or exclusive or or exclusive disjunction
[10] XOR is an operation in this branch of algebra, named for a British logician, which mimics set theory.
ANSWER: Boolean algebra
[10] XOR can be used to compute the non-carried digit when performing this operation on binary numbers. In Boolean algebra, OR is sometimes associated with this symbol, sharing its symbol and its identity of zero.
ANSWER: addition or summation (accept word forms)

(4) Answer some questions about the physiology of a plant root for ten points each.
[10] This structure of the endodermis of a plant root forces solutes to stop travelling the apoplastic pathway before entering the vascular tissue in the stele.
ANSWER: Casparian strip
[10] The Casparian strip is a modification of this rigid outer portion of cortical plant cells. It includes the middle lamella and is made of cellulose microfibrils cross-linked with hemicelluloses.
ANSWER: cell wall
[10] The Casparian strip achieves its ability to prevent entry of any water or solutes because it is impregnated with lignin and this highly hydrophobic substance, the primary constituent of cork.
ANSWER: suberin

(5) The True Whig party dominated the politics of this country until the death of its leader William Tolbert. For ten points each:
[10] Name this African country established by former American slaves sent there during the Presidency of James Monroe.
ANSWER: Republic of Liberia
[10] Tolbert had been overthrown by Samuel Doe, an ally of this man, who served as Liberian President from 1997 to 2003. He lost power in the Liberian Civil War, and in 2012, he was sentenced to 50 years in prison for terrorism by the International Criminal Court.
ANSWER: Charles Taylor
[10] One military leader in the Liberian Civil War was this man who confessed to chopping up human hearts to feed to his child soldiers. He notably ran into battle with only a gun and sneakers.
ANSWER: General Butt Naked (or Joshua Milton Blahyi)

(6) One story in this collection sees Gualtieri, the Marquis of Saluzzo, test the patience of his wife, Griselda, and that story inspired Chaucer's *Clerk's Tale*. For ten points each:
[10] Identify this collection of stories told by the Brigata, a group of seven men and three women.
ANSWER: The Decameron
[10] *The Decameron* is a work by this Italian author, who wrote about the title character's affair with Panfilo in *Lady Fiammetta's Elegy*.
ANSWER: Giovanni Boccaccio
[10] The story of Gualtieri and Griselda in *The Decameron* was told by this male character. He usually told the last story of the night, and never conformed to the theme
ANSWER: Dioneo

(7) Early characters on this television show include two "wild and crazy guys" played by Dan Aykroyd and Steve Martin. For ten points each:
[10] Name this late-night NBC comedy variety show which opens with the line "Live from New York" and has featured such Second City comedians as John Belushi and Chris Farley.
ANSWER: Saturday Night Live (accept SNL)
[10] This former SNL comedian played an African prince in the film *Coming to America*. More recently, this actor starred in such films as *The Nutty Professor* and *Daddy Day Care* and he voiced Donkey in *Shrek*.
ANSWER: Edward "Eddie" Murphy
[10] While a member of SNL, Murphy portrayed this cigar-chomping companion of Pokey the horse.
ANSWER: Gumby

(8) This rebellion was sparked after a bill requiring $134 worth of land needed in order to vote was passed. For ten points each:
[10] Name this early 1840s rebellion which saw fighting at Vernon Mill and Woonsocket, and which sought to establish universal white male suffrage in Rhode Island. Its namesake set up the People's Convention in its wake.
ANSWER: Dorr's Rebellion
[10] Dorr's Rebellion occurred during the tenure of this president, who controversially chose to not send troops to put it down. This successor of "Tippecanoe" William Henry Harrison also authorized the annexation of Texas.
ANSWER: John Tyler
[10] This court case arose from Dorr Rebellion and challenged the validity of the newly created government. It determined that "Congress must determine whether 'republican government' is republican or not," and that it is not up to the courts to decide.
ANSWER: Luther v. Borden (accept in either order)

(9) Answer the following about ordinal numbers for ten points each.
[10] Ordinal numbers were defined by this developer of set theory in order to solve a problem on trigonometric series. He is better known for proving that the real numbers are uncountable.
ANSWER: Georg Cantor
[10] Countable sets are ones which have a one-to-one correspondence with this set. The Peano Axioms define this set as iterated successors of 0. This set consists of all finite ordinal numbers.
ANSWER: natural numbers (accept whole numbers, accept N or W)
[10] [MODERATOR NOTE: ω is read "omega"] The addition of ordinal numbers does not have this property since $\omega + 1$ is not equal to $1 + \omega$. The addition of real numbers, though, has this property, since $a + b$ equals $b + a$ in that set.
ANSWER: commutative property or commutativity

(10) She gave birth to the twins Lava and Kusha after being abandoned in the hermitage of the Sage Valmiki. For ten points each:
[10] Name this daughter of Bhumi who was taken by the demon Ravana to Lanka, forcing her husband and his army of vanaras to attack the island.
ANSWER: Sita
[10] The aforementioned war is the subject of this Hindu epic, whose titular avatar of Vishnu is forced into exile in the forest with Sita and his brother Lakshmana.
ANSWER: Ramayana
[10] After the end of the war, this younger brother of Ravana is allowed to take the throne due to his benevolence. This rakshasa attempted to convince his brother to return Sita before the war and divulged secrets that allowed Rama to win.
ANSWER: Vibhishana

(11) Answer the following about stained glass artists for ten points each:
[10] This artist designed the axial windows of the Reims Cathedral and the *Chicago Windows*, but is better remembered for paintings like *I, and the Village*.
ANSWER: Marc (Zaharovich) Chagall
[10] This painter briefly experimented with stained glass alongside fellow De Stijl artist Theo van Doesburg. This artist's paintings include *Still Life with Ginger Pot* and *Broadway Boogie-Woogie*.
ANSWER: Piet Mondrian
[10] In order to imitate the glowing of gems, stained glass was set into the windows this architect's Notre Dame du Haut. This Swiss-French proponent of the International System also designed the Villa Savoye.
ANSWER: Le Corbusier or (Charles-Édouard Jeanneret-Gris)

(12) In his final appearance, he returns to Styles Court, shoots Stephen Norton in the forehead, and writes a confession to Arthur Hastings. For ten points each:
[10] Identify this detective, whose most famous appearance saw him discover two explanations for the murder and twelve stab wounds of Mr. Ratchett in *The Murder on the Orient Express*.
ANSWER: Hercule Poirot (accept either underlined part)
[10] Hercule Poirot was created by this author. She also created the amateur detective Miss Marple and wrote about the murder of Luke Enderby in *Butter in a Lordly Dish*.
ANSWER: Agatha Christie
[10] *Butter in a Lordly Dish* was the first of a series of radio plays by members of the Detection Club. The last of those plays was this author's *Where Do We Go From Here?* This author was most famous for creating the amateur detective Lord Peter Wimsey.
ANSWER: Dorothy L. Sayers

(13) H. K. Onnes first demonstrated this property by immersing a mercury wire in liquid helium. For ten points each:
[10] Identify this phenomenon in which a material exhibits no electrical resistance when cooled to a low temperature.
ANSWER: superconductivity
[10] Ettore Majorana postulated that superconductors contain a type of this half-integer spin particle. These particles obey the Pauli Exclusion Principle, and examples of them include protons and electrons.
ANSWER: fermions
[10] This effect arises when a Cooper pair crosses an SIS junction between two superconductors, resulting in quantum tunneling.
ANSWER: Josephson effect

(14) This battle saw the sinking of the *USS Bismarck Sea*, and it saw fierce fighting from its 21,000 strong garrison under command of General Kuribayashi. For ten points each:
[10] Name this battle of the Pacific theater of World War II in which Americans sought a namesake island for the use of its airstrips. It was immortalized by Joe Rosenthal's picture of marines raising a U.S. flag.
ANSWER: Battle of Iwo Jima
[10] Among the U.S. forces at Iwo Jima were soldiers from this tribe of native Americans, who served as Code Talkers.
ANSWER: Navajo
[10] The Battle of Iwo Jima was succeeded by this battle, also known as Operation Iceberg. The end of the Allied forces's Island Hopping strategy, kamikaze strikes led to the highest number of casualties for a Pacific theater battle.
ANSWER: Battle of Okinawa

(15) This Medici-commissioned work was inspired by a poem describing the arrival of spring. For ten points each:
[10] Identify this work set in an orange grove depicting three Graces in white dancing to the left of a fully-clothed Venus. On the right side, Zephyr attacks the nymph Chloris.
ANSWER: La Primavera (or Allegory of Spring)
[10] This artist of *La Primavera* was influenced by Savonarola to create religious paintings like *Mystical Nativity*, but is best known for his *The Birth of Venus*.
ANSWER: Sandro Botticelli (or Alessandro di Mariano di Vanni Filipepi)
[10] Botticelli depicted this scene in which a seated Virgin Mary presents her child to the title group. Botticelli used himself and members of the Medici family as models for this work.
ANSWER: Adoration of the Magi

(16) This figure once escaped from the hog-man Kamapua'a, and she is in love with the chief Lohiau. For ten points each:
[10] Name this Pacific goddess of volcanoes. Her namesake hair and tears are geographic features made from lava.
ANSWER: Pele
[10] Pele, along with Lona and Ku is a deity of this island nation. Maui created these islands when his fishhook got caught on the ocean floor, and a large island in this chain now bears his name.
ANSWER: Hawaii
[10] The chief deity in the Hawaiian pantheon is this god of light and creation. Drawing some Biblical parallels, this god forbid Kumu-Honua and Lalo-Honua from eating a forbidden fruit.
ANSWER: Kane

(17) This thinker described his beliefs in the work *Know Yourself*, and he wrote a text which featured 158 questions titled *Sic et Non*. For ten points each:
[10] Name this philosopher and theologian whose love affair Heloise was recalled in his *History of My Calamities*.
ANSWER: Peter Abelard (accept Petrus Abelardus or Pierre Abélard)
[10] Heloise's uncle Fulbert arranged for Abelard to undergo this process after learning of their affair. Eunuchs are men who have undergone this process.
ANSWER: castration (accept equivalents)
[10] Unlike Abelard, this man chose to castrate himself in order to get into Imperial Service. According to some records, this secretary during the Ming Dynasty sailed as far as the East Coast of Africa with his "Treasure Ships."
ANSWER: Zheng He (accept Cheng Ho, Ma He, or Sanbao)

(18) Answer the following about masters in Russian literature for ten points each.
[10] This author wrote about the writer Berlioz, Professor Woland, and Pontius Pilate in *The Master and Margarita*.
ANSWER: Mikhail (Afanasyevich) Bulgakov
[10] This author wrote about Vasili Andreevich Brekhanov giving his coat to the servant Nikhil in *Master and Man*, but was more famous for such works as *Anna Karenina* and *War and Peace*.
ANSWER: Lev Nikolayevich Tolstoy (or Leo Tolstoy)
[10] This author's short stories include *The Master* and a story about kringle-makers and the sixteen-year-old Tanya, Twenty-six Men and a Girl.
ANSWER: Maxim Gorky (or Alexei Maximovich Peshkov)

(19) This man distinguished between a language itself, called langue, and its use, called parole. For ten points each:
[10] Name this Swiss thinker who discussed langue and parole in his work *Course in General Linguistics*. His work in semiotics includes the distinction between signifier and signified.
ANSWER: Ferdinand de Saussure
[10] Saussure was a figure in this scientific field which studies language. Branches in this field include semantics, phonetics, and grammar.
ANSWER: linguistics
[10] This American linguist criticized Saussure for an underdeveloped notion of a sentence in the langue and parole model. He is the namesake of a hierarchy for formal grammars and wrote *Syntactic Structures*.
ANSWER: Noam Chomsky

(20) The polarity of a bond is determined by comparing this value for the two atoms. For ten points each:
[10] Name this property measures the tendency for an atom to attract another atom's electrons to itself.
ANSWER: electronegativity
[10] This scientist proposed a scale for measuring electronegativities based on bond dissociation energies, for which fluorine has the highest value.
ANSWER: Linus Pauling
[10] The Allred-Rochow equation determines electronegativities by considering this value, the positive charge of the nucleus experienced by an electron, which may be calculated using Slater's rules. For a single electron, it equals the atomic number minus the number of non-valence electrons.
ANSWER: effective nuclear charge or Z_{eff}

(21) Squaring this number gives the Cauchy number for ideal gases. For ten points each:
[10] Name this quantity computed as the velocity of an object traveling in a medium divided by the speed of sound in the medium. Since it is dimensionless, the value of the quantity comes after the unit of measure.
ANSWER: Mach number
[10] For incompressible fluids and compressible fluids with a low Mach number, this equation is used to relate the speed of the fluid with its pressure and potential energy. It is used to model the lift force of an airplane wing.
ANSWER: Bernoulli's equation or formula
[10] While the Bernoulli equation applies to situations in which the total head remains constant, this doubly-eponymous equation gives the loss in mechanical energy for a fluid experiencing flow expansion.
ANSWER: Borda-Carnot equation