

Ladue Invitational Spring Tournament IV

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Round 1**Tossups**

1. William Alden Smith led a Senate investigation into this event, which might have been prevented had David Blair's key to some missing binoculars been found. Molly Brown urged for the rescue of survivors of this event, whose remains were discovered by Robert Ballard. J. Bruce Ismay, the (*) White Star Line executive at the time, was criticized for escaping this event while women and children were still at risk. Since the nearest radio operator had gone to bed, survivors of this event had to wait several hours to be rescued by the RMS *Carpathia*. For ten points, identify this 1912 event in which a large British passenger liner collided with an iceberg in the North Atlantic.

ANSWER: sinking of the RMS Titanic [accept clear-knowledge equivalents]

<JD>

2. In one process, an unstable intermediate formed by adding three molecules of this compound breaks down into 3-phosphoglycerate, and that process is sometimes preceded by one in which this compound is added to form oxaloacetate and malate. An abnormally high amount of this substance in the blood is called hypercapnia and can lead to acidosis, as it forms an acid that is part of the (*) bicarbonate buffering mechanism. Yeast fermentation results in ethanol and this compound, which RuBisCO uses as a source of carbon atoms in the Calvin cycle. For ten points, name this gas that is used in photosynthesis and produced by respiration, whose chemical formula is CO₂.

ANSWER: carbon dioxide [accept CO₂ before mentioned]

<BZ>

3. In this film, one character shoots Shannon with a tranquilizer dart shortly after she notices her date is wearing a wig from the merchant Floyd Eagle-san. In one scene, Antonio is frozen into a block of ice at a Cinco de Mayo party, and in another, the pet chicken Pollito launches a rocket headed towards a volcano. Dr. (*) Nefario joins Eduardo Perez in creating furry purple monsters from the PX-41 mutagen in this movie. The Anti-Villain League recruits this movie's central character, who successfully foils the plan of super-villain El-Macho. For ten points, identify this 2013 animated film in which Gru marries Lucy to the delight of Edith, Margo, Agnes, and several minions.

ANSWER: Despicable Me 2 [do not accept or prompt on "*Despicable Me*"]

<KT>

4. The removal of one ethnic group from this modern-day country's borders included the events on Red Sunday and a siege at Van. John F. Kennedy agreed to remove Jupiter missiles from this country to defuse the Cuban Missile Crisis. This country's penal code includes a controversial Article 301 that has been used to crack down on dissidents who have discussed the (*) Armenian Genocide orchestrated by this country. This country invaded Cyprus in 1974 and set up a republic in the northern half of the island. For 10 points, name this country that was once led by Mustafa Kemal Atatürk and includes cities like Ankara and Istanbul.

ANSWER: Republic of Turkey [or Türkiye Cumhuriyeti]

<BZ>

5. BKS theory concerns the interaction between matter and these particles, whose polarization is used to test the EPR paradox. Their energy can be expressed as h -bar times angular frequency, and the Klein-Nishina formula can be used to find the differential cross section of these particles as they undergo (*) Compton scattering. The energy of these particles equals Planck's constant times frequency. Their wave-particle duality and interaction with surface electrons in metals led Albert Einstein to discover a namesake effect and support the idea of quantized energy. For ten points, identify these bosonic particles that carry the electromagnetic force.

ANSWER: photons

<EC>

6. One character in this play demands that he be covered as well in his father's funeral, and commands, "Now pile your dust upon the quick and dead." Another character in this play mourns how his mother had "followed my poor father's body Like Niobe" before remarking, "frailty, thy name is woman." The central character swaps execution letters before entering England, leading to the deaths of two friends from Wittenberg, (*) Rosencrantz and Guildenstern. During his duel with Laertes, the title character kills his uncle Claudius. For ten points, name this Shakespearean tragedy about a Prince of Denmark who asks, "to be or not to be."

ANSWER: *The Tragedy of Hamlet: Prince of Denmark*

<KT>

7. One ruler of this empire built a torture chamber disguised as a palace that was known as the ruler's namesake "Hell." Another ruler of this empire was visited by the ambassador Megasthenes. The founder of this empire was known by the Greeks as Sandrokottos and overthrew the Nanda Dynasty with the help of his advisor Chanakya. The most famous ruler of this empire constructed a sculpture of (*) four lions at Sarnath as part of a series of rock and pillar edicts. The bloodshed from the conquest of Kalinga caused that ruler of this empire to convert to Buddhism. For ten points, identify this Indian empire that was ruled by Chandragupta and Ashoka.

ANSWER: Mauryan Empire

<JD>

8. This function of $-st$ ["negative 's' 't'"] appears in the integrand for a Laplace transform, and it is also equal to the sum of hyperbolic sine and hyperbolic cosine. It can be represented as the Taylor series x to the n over n factorial for nonnegative integers n , and this function is a solution to the differential equation $y' = y$ ["y prime equals y"], which means the derivative of this function is (*) itself. This function lies entirely above the x -axis, and is equal to the limit as n approaches infinity of quantity "one plus x over n " raised to the n th power. For ten points, identify this function, the inverse of the natural logarithm, that raises Euler's constant to a power of x .

ANSWER: exponential function [accept $y = e^x$; read " e to the x power"]

<EC>

9. This author wrote a short story in which Jonathan is robbed of twenty pounds, but disregards it because "Nothing Puzzles God." In addition to *Civil Peace*, this author wrote a work in which the protagonist befriends Joseph and convinces Clara Okeke to undergo an abortion. In the prequel to that work, a family is exiled for seven years after a gun explosion kills (*) Ezeudo's son. The most famous novel of this author of *No Longer at Ease* features a character who hangs himself after killing Ikemefuna to avoid trial by Christian missionaries. For ten points, name this Nigerian author who wrote about Okonkwo in *Things Fall Apart*.

ANSWER: Chinua Achebe [or Albert Chinualumogu Achebe]

<MP>

10. This author wrote a poem in which the speaker describes “The skies” as “ashen and sober,” and another poem depicted a ruler that has “won usurpingly...the same heritage hath giv’n/Rome to the Caesar.” In addition to *Ulalume* and *Tamerlane*, he wrote a short story narrated by a man who reads *The Mad Tryst* to (*) Roderick shortly before the title event occurs. The most famous work of this writer of *The Fall of the House of Usher* asks if there is “balm in Gilead” and laments the loss of Lenore. For ten points, name this American poet who wrote *The Raven*.

ANSWER: Edgar Allen Poe

<MP>

11. The genus *Chromatium* produces this element through oxidation, and the 3d orbitals in this element may contribute to catenation. This element’s phase diagram has three triple points because it has two solid phases. Thiol groups of it function in biomolecular binding, such as in Coenzyme A, and this element also forms (*) crosslinking polymer chains during vulcanization. As a pure solid, this element forms a cyclic molecule with eight atoms, and one compound of this element and hydrogen smells like rotten eggs. For ten points, identify this yellow element with atomic number 16.

ANSWER: sulfur [or S]

<EC>

12. Justus Scheibert studied the military tactics of this war, while Arthur Fremantle took a three-month tour of the countries involved. Jennie Hodgers fought in this conflict while disguised as Albert Cashier. Technological advancements made during this war included the development of Springfield rifles that loaded Minie balls and the invention of the (*) Gatling gun. The American Red Cross was founded after this war by Clara Barton, who worked as a nurse during it. Most of the fighting in this war ended after one commander surrendered at Appomattox Courthouse. For 10 points, name this war that pitted the United States against the Confederate States of America.

ANSWER: American Civil War [accept War between the States or War for Southern Independence or War of Secession]

<BZ>

13. In the Fisher effect, one form of this quantity remains constant even when the price level increases. One form of this quantity constitutes the Y axis of the IS-LM model and another form constitutes that of the macroeconomic money market. The “real” form of this quantity equals the nominal one minus the expected rate of inflation, and when policies targeting these are ineffective, a (*) liquidity trap occurs. The APR is a yearly form of this quantity, and dividing 72 by this quantity can estimate how many years it takes for an investment to double. For ten points, name this quantity which can be simple or compounding and is defined as the price of borrowing money.

ANSWER: interest rate

<BZ>

14. The tachocline layer of this body experiences high shear that may be responsible for forming strong magnetic fields, and data from this entity is collected by the SOHO spacecraft. This object contains features that cycle according to Sporer’s law, and those features were notably rare during the (*) Maunder Minimum. This body contains a boundary known as the termination shock and produces mass ejections from its corona. Comet tails point away from this object due to its emission of high energy plasma, which forms the shape of Earth’s magnetosphere and is responsible for auroras. For ten points, identify this star in the center of our solar system.

ANSWER: the Sun [accept Sol]

<EC>

15. This man used bush-hammered concrete in a work set in Boulder, Colorado that was inspired by Anasazi cliff dwellings. In addition to the Mesa Laboratory, this architect, who recently completed the Museum of Islamic Art in Doha, also designed a triangular nine-story building with a vertically-hanging American flag, the (*) John F. Kennedy Presidential Library. Another of his works was built on the shore of Lake Erie in downtown Cleveland. For ten points, name this Chinese-American architect of the Rock and Roll Hall of Fame and the glass pyramids at the Louvre.

ANSWER: Ieoh Ming Pei

<KT>

16. In the guise of Grímnir, this god received a drink from Agnar after being tortured for eight days by King Geirroth. This god owns a hall called Gladsheim and can see the entire world from his throne of Hlidskjalf. His son Vidarr avenges his death with a leather shoe, and since he drinks nothing but wine and mead, this god feeds all his food to (*) Geri and Freki. He gained knowledge about runes after hanging from Yggdrasil for nine days and sought wisdom by paying an eye to drink from the Well of Mimir. This rider of the eight-legged horse Sleipnir is the husband of Frigg and leader of the Aesir. For ten points, name this “Allfather,” the chief Norse god.

ANSWER: Odin [accept Woden or Wodinaz]

<BZ>

17. In one of this author’s novels, the protagonist accidentally dances during the wrong part after being distracted by his love-interest Ingeborg Holm. This author also wrote a novel about a character who falls in love with Clavdia Chauchat and meets his tuberculosis-infected cousin, Joachim (*) Ziemssen, in the “flatlands.” In another one of his works, the protagonist develops passionate feelings for the Polish boy Tadzio in a cholera-infected city. For ten points, identify this author of *Tonio Kroger* who wrote about Hans Castorp in *The Magic Mountain* and Gustav von Aschenbach in *Death in Venice*.

ANSWER: Paul Thomas Mann

<KT>

18. This man won an election whose integrity was supposedly assured by the installation of 180,000 webcams. This man allegedly stole a Super Bowl ring from New England Patriots owner Robert Kraft, but later said it was a gift. This man signed a bill banning adoptions by Swedish citizens and also banned adoptions by US citizens after the passage of the Magnitsky Act. In 2012, two members of the (*) feminist band Pussy Riot were imprisoned for protesting the policies of this leader. After serving two terms as president, this man became prime minister under Dmitry Medvedev, who currently serves under this man. For ten points, name this current president of Russia.

ANSWER: Vladimir Vladimirovich Putin

<BZ>

19. One skyscraper in this city nicknamed the “Walkie-Talkie” drew criticism when sunlight that reflected off of it damaged nearby cars. An aircraft warning light sits atop a pyramid pinnacle on this city’s One Canada Square, which was recently surpassed by the Renzo Piano-designed (*) Shard as its country’s tallest building. Older structures in this city include a banqueting house at the Palace of Whitehall and the Christopher Wren-designed St. Paul’s Cathedral. In 2012, its Tower Bridge was decorated with a set of Olympic rings. For ten points, identify this city where Buckingham Palace and Big Ben lie along the River Thames.

ANSWER: London

<JD>

20. This composer wrote an opera based on a Henrik Hertz play named *Iolanta*. Another of his operas features a “Letter aria” and centers on the daughters of Madame Larina. His final completed symphony references the Orthodox requiem and includes a limping waltz in 5/4. A more famous composition by this composer of *Symphony* (*) *Pathétique* ends with the hymn “God Save the Tsar” after suppressing the anthem “La Marseillaise,” which represents

Napoleon's attack on Russia. For ten points, name this Russian composer who showed the death of Lensky in his opera *Eugene Onegin* and used cannon fire in his *1812 Overture*.

ANSWER: Pyotr Ilyich Tchaikovsky

<KT>

21. One character in this play is kicked out of the Flamingo Hotel due to her immoral behavior. A former English teacher in this work is fired because of an affair with a 17-year-old student, and a character who resides in Elysian Fields Avenue throws a radio out of a window during (*) Mitch's poker game in this work. When the protagonist is taken to an asylum in the last scene of this play, she tells another character that she "always depended on the kindness of strangers." Stanley rapes the sister of Stella Kowalski in, for ten points, what play by Tennessee Williams about a Southern Belle named Blanche Dubois?

ANSWER: A Streetcar Named Desire

<KT>

22. One of these works says to remove the plank from one's own eye before removing the sawdust in the eyes of others. A rich fool dies on the same day he builds a bigger barn in one of these works, while in another, a servant whose ten thousand talent debt to the king is forgiven imprisons a fellow servant for not paying a debt of only a hundred denarii. One of these tells of a son who (*) wasted his fortune but is still welcomed home by his father, and another tells of a beaten-up traveler who is ignored by a priest and a Levite passing by on the road. For ten points, name these stories, including those of the Prodigal Son and the Good Samaritan, which the Christian Messiah used to teach his followers.

ANSWER: parables of Jesus [accept equivalents like stories of Jesus until mention; prompt on more vague answers like "speakings" or "teachings" of Jesus or "parables" in general; prompt on partial answer; accept "Christ" in place of "Jesus"]

<JD>

Bonuses

1. Bonus: The title character of this work is described as “the most striking figure in Starkland.” For ten points each:

[10] Name this novel in which the main character develops a passion for Mattie Silver, the cousin of his wife, Zeena. His hidden love eventually convinces him and Mattie to crash into a tree while sledding.

ANSWER: Ethan Frome

[10] This American author of *Ethan Frome* also wrote about the failed relationships of Lily Bart in *The House of Mirth*.

ANSWER: Edith Wharton [or Edith Newbold Jones]

[10] In this work by Wharton, Newland Archer doubts his commitment to marry May Welland after meeting her beautiful cousin, Ellen Olenska.

ANSWER: *The* Age of Innocence

<KT>

2. Bonus: One of this sport’s tournaments, played at Augusta National on the first weekend in April, is known as The Masters. For ten points each:

[10] Name this sport played by Tom Watson, Phil Mickelson, and Tiger Woods.

ANSWER: golf

[10] This man won the 2013 Masters after a two-hole playoff to beat Angel Cabrera. He became the first Australian player to win the Masters after he birdied hole 10 in the playoff.

ANSWER: Adam Derek Scott

[10] Scott, like all Masters winners, donned this colorful clothing item, worn by members of Augusta National. It is traditionally awarded to the winner of the Masters by the previous year’s winner.

ANSWER: Green Jacket

<SC>

3. Bonus: Its four official languages are German, French, Italian, and Romansch. For ten points each:

[10] Identify this alpine country, which holds the European headquarters of the United Nations in its city of Geneva.

ANSWER: Switzerland [or Swiss Confederation]

[10] Switzerland is divided into 26 of these administrative subdivisions. Although derived from French, they share their name with the historical name of the Chinese province of Guangzhou.

ANSWER: canton

[10] The canton of Valais is home to this mountain straddling the border between Switzerland and Italy, which has four steep faces facing the four principal directions and was the last great alpine peak to be ascended.

ANSWER: Matterhorn [or Monte Cervino; or Mont Cervin]

<JD>

4. Bonus: He served for the British in the Battle of Waiwand. For ten points each:

[10] Name this fictional biographer who once was engaged to Mary Morston and lives with a certain friend in 221B Baker Street upon the suggestion of Stamford.

ANSWER: Dr. John H. Watson [accept either underlined portion]

[10] Dr. Watson accompanies this detective, the first to use a magnifying lens in a crime scene. In “A Scandal in Bohemia”, this character determines that Irene Adler kept her photograph in a bell pull.

ANSWER: Sherlock Holmes [accept either underlined portion]

[10] In this work by Sir Arthur Conan Doyle, Stapleton hopes to kill Sir Henry and inherit his fortune, and Holmes and Watson shoot an animal coated in phosphorus.

ANSWER: *The* Hound of the Baskervilles

<KT>

5. Bonus: One member of this tribe, Stand Watie, became a Confederate Brigadier General. For ten points each:

[10] Name this Southeastern Indian tribe whose alphabet and writing system were invented by Sequoyah. Despite those advancements, Andrew Jackson would later force its members to suffer through the Trail of Tears.

ANSWER: **Cherokee** [or **Tsalagi**]

[10] This treaty, named for the capital of the Cherokee nation, agreed to exchange Cherokee lands for settlements in Oklahoma. The Senate ratified it even though it lacked Principal Chief John Ross' signature.

ANSWER: Treaty of **New Echota**

[10] The Cherokee nation was part of this group of Indian tribes, which also included the Choctaw and Seminole tribes. This group was so named because its members had adopted many aspects of Western culture.

ANSWER: **Five Civilized** Tribes [prompt on partial answer]

<BZ>

6. Bonus: One president of this country made the "December Mistake". For ten points each:

[10] Name this country whose currency was devalued under the presidency of Ernesto Zedillo and which is home to the PRI.

ANSWER: **Mexico** [accept **United Mexican States** or **Estados Unidos Mexicanos**]

[10] This current president of Mexico succeeded Felipe Calderon after beating Lopez Obrador and Josefina Mota in the 2012 presidential election.

ANSWER: Enrique **Peña Nieto** [prompt on partial answer]

[10] Peña Nieto has said that he wants to better integrate Mexico's economy with that of the US and Canada in order to facilitate the goals of this 1993 agreement that removed trade barriers between the three countries.

ANSWER: **NAFTA** [or **North American Free Trade Agreement**]

<BZ>

7. Bonus: It was based on a novella by Prosper Mérimée. For ten points each:

[10] Name this opera that focuses on the story of Don Jose. It includes a famous "Toreador Song" and "Habanera," the latter of which suggests that "love is a rebellious bird."

ANSWER: **Carmen**

[10] This French composer of *Carmen* included a friendship duet sung by Zurga and Nadir, "Au fond du temple saint," in his opera, *The Pearl Fishers*. He also wrote the incidental music for *L'Arlesienne*.

ANSWER: Georges **Bizet** [also accept Alexandre César Léopold **Bizet**]

[10] This lieutenant of Dragoons in *Carmen* orders Jose to bind Carmen's hands after she mockingly defends stabbing a woman. A group of smugglers later restrain this character.

ANSWER: Officer **Zuniga**

<KT>

8. Bonus: In this work, Esteban knocks out Blanca's front teeth after discovering her relationship with Pedro Tercero. For ten points each:

[10] Identify this novel set in the Las Tres Marías hacienda, which describes Estaban's marriage to Clara del Valle.

ANSWER: *The* **House of the Spirits** [or *La* **casa de los espíritus**]

[10] This Chilean author wrote *The House of the Spirits* and also wrote about a character who lives with Huberto Naranjo before falling in love with the journalist Rolf Carle in *Eva Luna*.

ANSWER: Isabel **Allende** Llona

[10] In *The House of the Spirits*, Clara's sister Rosa the Beautiful and her granddaughter Alba both have hair of this color. In *The Great Gatsby*, Jay sees a light of this color at the end of Daisy's dock.

ANSWER: **green**

<KT>

9. Bonus: One monarch of this name married Sophia Frederica Augusta. For ten points each:

[10] Identify this name, which was held by a Tsar of Russia who instituted a beard tax on the boyars and won the Great Northern War against Sweden.

ANSWER: **Peter** [or **Pyotr**; accept **Peter the Great**, **Peter I**, or **Peter III**]

[10] Peter III married and was probably assassinated by this Russian Tsarina, who was formerly named Sophia Frederica Augusta. She gained a reputation as an “enlightened despot” after patronizing intellectuals like Diderot.

ANSWER: **Catherine the Great** [or **Catherine II**; accept **Yekaterina** or **Katharina** in place of “Catherine”]

[10] Catherine the Great helped get this former lover of hers elected to the Polish throne in 1764. This last king of Poland was unable to prevent the three partitions that led to the destruction of his country.

ANSWER: Stanislaw August **Poniatowski** [accept **Stanislaw II** August]

<BZ>

10. Bonus: The majority of these objects were originally disregarded because their namesake was primarily focused on finding comets. For ten points each:

[10] Identify these 110 astronomical objects, including nebulae, star clusters, and galaxies, that were compiled into a list by its namesake French astronomer.

ANSWER: **Messier** objects [accept **Messier** list or **Messier** catalogue]

[10] This elliptical galaxy discovered by Messier is studied for its powerful emission of radio waves and notably features a relativistic jet of plasma extending out from a supermassive black hole at its core.

ANSWER: **Messier 87** [accept **M87** or **Virgo A** or **NGC 4486**]

[10] This other Messier object, termed M31, is the nearest spiral galaxy to the Milky Way and the largest in the Local Group. Edwin Hubble discovered the first Cepheid variables in this galaxy.

ANSWER: **Andromeda** Galaxy [accept **NGC 224** or Great **Andromeda** Nebula]

<EC>

11. Bonus: The philosophical zombie is one thought experiment supporting this idea. For ten points each:

[10] Name this theory opposed to monism, and which claims that the mind and body are separate entities.

ANSWER: mind-body **dualism** [accept word forms]

[10] One proponent of mind-body dualism was this man, who suggested that the soul interacted with the body in the pineal gland. He is better known for formulating the principle of “I think, therefore I am” in *Discourse on Method*.

ANSWER: René **Descartes**

[10] In *The Concept of Mind*, Gilbert Ryle attacked Cartesian dualism by describing it with this phrase and claiming that Descartes committed a category mistake. This phrase also titles a book by Arthur Koestler.

ANSWER: **ghost in the machine**

<BZ>

12. Bonus: Themistocles was once subject to this practice in Argos. For ten points each:

[10] Identify this ancient democratic practice in which a citizen could be exiled for ten years. Today, it is synonymous with social rejection.

ANSWER: **ostracism** [also accept word forms like **ostracize**]

[10] Ostracism was introduced to this ancient Greek city-state by the reformer Cleisthenes, whose nephew was among the first to be ostracized. Other leaders of this city have included Solon and Pericles.

ANSWER: **Athens** [accept **Athína** or **Athēnai**]

[10] One Athenian politician of this name, a son of Melesias, was ostracized after confronting Pericles. A more famous man of this name wrote *The History of the Peloponnesian War*.

ANSWER: **Thucydides** [or **Thoukudídēs**]

<JD>

13. Bonus: This process is exhibited by rotating a metal coil between two magnetic poles. For ten points each:

[10]: Name this phenomenon in which a current is produced due to a changing magnetic field.

ANSWER: electromagnetic induction

[10]: Faraday's law of induction is one of the four equations published by this Scottish physicist that also includes Gauss's laws and Ampere's law.

ANSWER: James Clerk Maxwell

[10]: This other law states that an induced electromotive force will create a magnetic field that opposes the change in flux, thus obeying the conservation of energy.

ANSWER: Lenz's law

<EC>

14. Bonus: This object came with a scabbard that prevented its owner from bleeding to death. For ten points each:

[10] Name this legendary sword wielded by King Arthur, which was given to him by the Lady of the Lake.

ANSWER: Excalibur [accept Caledfwlch or Caliburn]

[10] This man stole Excalibur's scabbard and threw it into a lake before fatally wounding Arthur at the Battle of Camlann. This son of Arthur and his half-sister Morgause usurped his father's throne during his absence.

ANSWER: Mordred [accept Medraut or Medrod]

[10] Before dying, Arthur asks this knight to return Excalibur to the Lady of the Lake. As he throws Excalibur into the water, a mysterious hand appears and grabs the sword as it falls.

ANSWER: Sir Bedivere [or Bedwyr]

<BZ>

15. Bonus: Its protagonist feels that a walled picture of Goethe insults the novelist's brilliance. For ten points each:

[10] Name this work in which a saxophonist named Pablo introduces Harry Haller to the metaphorical "Magic Theatre," a place where Hermine is eventually murdered.

ANSWER: Steppenwolf [or *Der Steppenwolf*]

[10] *Steppenwolf* was the tenth novel written by this German author, whose other works include *Demian* and *Siddhartha*.

ANSWER: Hermann Hesse

[10] Joseph Knecht achieves the title of Magister Ludi in the fictional province of Castalia in this work by Hesse.

ANSWER: *The* Glass Bead Game [or *Das Glasperlenspiel*]

<KT>

16. Bonus: This treaty replaced the papal bull *Inter caetera*, which was issued by Alexander VI. For ten points each:

[10] Identify this 1494 treaty that gave all lands west of an imaginary line in the New World to Spain and all lands east of it to Portugal. It was rendered moot when Portugal claimed lands west of the line anyway.

ANSWER: Treaty of Tordesillas

[10] The Portuguese lands east of the line of demarcation established by the Treaty of Tordesillas became this country, which was first explored by Pedro Cabral and is the largest country in South America.

ANSWER: Federative Republic of Brazil

[10] This adjective describes an 1888 law that abolished slavery in Brazil. This substance is also found in the colonial name of Ghana, where it was mined.

ANSWER: golden

<JD>

17. Bonus: At the end of this procedure, an X-ray film is used to detect its results. For ten points each:

[10] Identify this procedure named after a British biologist, in which single-stranded radioactive DNA probes are added to DNA fragments in order to detect them.

ANSWER: **Southern blotting**

[10] Southern blotting is often performed after this procedure, which uses an electric current to move fragments of DNA, RNA, or protein through a matrix such as agarose.

ANSWER: **gel electrophoresis** [prompt on “electrophoresis”]

[10] Before being run through a gel, DNA is cut with the restriction type of these molecules. This term refers to any protein that catalyzes a biological reaction by lowering its activation energy.

ANSWER: restriction **enzymes** [accept restriction **endonucleases**]

<BZ>

18. Bonus: His first child was born deformed because his wife spoke first at their wedding. For ten points each:

[10] Name this god who tried to retrieve his wife Izanami from Yomi after she died giving birth to the fire god Kagutsuchi.

ANSWER: **Izanagi**-no-Mikoto [or **Izanagi**-no-Okami]

[10] This kami was born after Izanagi washed his left eye. The center of this goddess’s worship is at the Grand Ise Shrine, which is torn down and rebuilt every twenty years, and emperors of Japan formerly claimed descent from her.

ANSWER: **Amaterasu**-ōmikami [accept **Ohirume-no-muchi-no-kami**]

[10] Izanagi and Amaterasu are two of the many kami of this Japanese belief system, which claims the islands of Japan were created from the drops of water that fell after Izanami and Izanagi stirred the seas with a spear.

ANSWER: **Shinto**ism [or **kami-no-michi**]

<BZ>

19. Bonus: A methane molecule displays this geometry, as the sp³ hybridized central carbon atom makes four equally-repelling bonds. For ten points each:

[10]: Identify this molecular geometry, with bond angles of 109.5 degrees, that has a central atom bonded to four substituents and no lone pairs.

ANSWER: **tetrahedral**

[10]: This model can be used to predict molecular geometries by considering electrostatic repulsion and commonly employs the A-X-E method.

ANSWER: **V**alence **S**hell **E**lectron **P**air **R**epulsion Theory [read as “vesper”]

[10]: This molecule does not exhibit tetrahedral geometry due to the presence of a lone pair. It is commonly found in cleaning products and has chemical formula NH₃.

ANSWER: **ammonia** [accept **azane**]

<EC>

20. Bonus: This painting is in the Museo del Prado and shows the horrors of a peninsular war. For ten points each:

[10] Name this painting which depicts a Napoleonic firing squad shooting a group of captives, and commemorates Spanish resistance on the title date.

ANSWER: *The* **Third of May, 1808** [or *El* **Tres de Mayo 1808** [*mil ochocientos y ocho*] *en Madrid*]

[10] *The Third of May, 1808* was painted by this Spanish artist whose other works include his “Black Paintings,” the most famous of which is *Saturn Devouring His Son*.

ANSWER: Francisco José de **Goya** y Lucientes

[10] Goya also created this set of tints, which includes *The Sleep of Reason Produces Monsters* and *Here Comes the Bogeyman*.

ANSWER: *Los* **Caprichos** [or *The* **Caprices**]

<MP>

21. Bonus: Answer these questions related to integration in calculus, for ten points each:

[10] One can take the integral of the function "1 divided by the quantity 1 plus x squared" using the inverse of this trigonometric function. In a right triangle, this function equals the ratio of the opposite side over adjacent side.

ANSWER: tangent

[10] This method of integration involves splitting up the integrand to obtain an easier antiderivative to work with. It applies the product rule for differentiation, and can be used to find the integral of natural log of x .

ANSWER: integration by parts

[10] The method of decomposition is often used to simplify rational functions in this form by splitting a larger one into a sum of smaller ones.

ANSWER: partial fractions

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22. In one of this author's plays, the townspeople listen to the accounts of Lady Frola and Mr. Ponza, each of whom is convinced that the other is insane. For ten points each:

[10] Name this Italian playwright who is better known for his play about a troupe of actors who approach a Stage Manager then reenact their personal drama, titled *Six Characters in Search of an Author*.

ANSWER: Luigi Pirandello

[10] In another Pirandello play, an actor playing Henry IV in a pageant endures this accident, then actually believes that he is the king when he regains consciousness.

ANSWER: falling off a horse [or any similar answer about horses]

[10] Many of Pirandello's plays are not written in Italian, but instead in the local tongue of this Italian island. The word "mafia" originated in this island's language as a term for "swagger" or "bravado."

ANSWER: Sicily [or Sicilia]

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