CALISTO 2

Head-edited by Justine French. Edited by Dylan Bowman, Robert Condron, Nicholas Dai, Arthur Delot-Vilain, Tasis Gemmill-Nexon, Alistair Gray, Jeffrey Ma, Govind Prabhakar, Shahar Schwartz, William Orr, Rohan Venkateswaran, and Eric Yin. Written by the editors and Yusuf Amanullah, Joy An, Ethan Ashbrook, Vikshar Athreya, Louis Li, Richard Lin, Joel Miles, Alex Moon, Madhumita Narayan, Arjun Panickssery, Nathan Sheffield, Ned Tagtmeier, and Alison Yau.

Packet 8

1. **If one of these numbers is a factor of *n*, then the Mobius function applied to *n* gives zero. Per a theorem named for Lagrange, any natural number can be expressed as the sum of four of these numbers. The sum of the first *n* of these numbers equals the product of *n*, *n* plus one, and 2*n* plus one, all over six. The sum of the first *n* (*)** odd numbers is the *n*th one of these numbers. These numbers cannot end with a 2, 3, 7, or 8. The difference of two of these numbers can be factored as "*a* plus *b*" times "*a* minus *b*." For 10 points, name these numbers like 1, 4, 9, and 16, which are equal to an integer times itself.
ANSWER: perfect **square**s [or **square** numbers]
<Math — Bowman> [Edited]

1. For 10 points each, answer the following about colonial explorers who met violent ends:
[M] This Spanish explorer was put on trial and beheaded in Panama by a rival colonial administrator. Earlier, he was the first European to cross the Isthmus of Panama and lay eyes on the eastern shore of the Pacific Ocean.
ANSWER: Vasco Núñez de **Balboa**
[E] The conquistador Francisco Pizarro, who conquered this empire, was killed in a violent attack orchestrated by Diego de Almagro II. Pizarro himself had this Andean empire's ruler Atahualpa executed in 1533.
ANSWER: **Inca** Empire [or **Tawantinsuyu**]
[H] Pedro de Valdivia, the first royal governor of Chile, was killed by these indigenous people. Conflicts between Chile and this indigenous people of the Araucanía region over logging and water use are still ongoing.
ANSWER: **Mapuche**
<European History—Amanullah> [Ed. Delot-Vilain]

2. **An ancient civilization on this body of water created marble figurines with crossed arms and no facial features except a simplistic nose. The type of prayer called hesychasm originated among the twenty monasteries on a mountain overlooking this body of water, Mount Athos. Around 1600 BC, a massive volcanic eruption formed a caldera in this sea's island of (*)** Thera, also called Santorini. In this sea, the Sporades archipelago is northeast of Euboea. This sea's Cycladic islands include Delos and Naxos. The Dardanelles connects this sea with the Sea of Marmara to its north. For 10 points, name this arm of the Mediterranean between Greece and Turkey.
ANSWER: **Aegean** Sea [prompt on Mediterranean Sea before "Mediterranean" is read]
<Geography — French> [Edited]

2. In one painting by this artist, Jesus puts his hand on his chest and looks upward while a man tries to take off his red clothing to prepare for the crucifixion. For 10 points each:

[M] Name this artist who painted *The Disrobing of Christ*. This mannerist artist depicted the Alcázar Citadel on the right as a storm gathers in the background in his *View of Toledo*.

ANSWER: El **Greco** [or Doménikos **Theotokópoulos**]

[E] El Greco was one of many artists to depict this woman's assumption into heaven. El Greco also depicted the archangel Gabriel appearing to this mother of Jesus in his *Annunciation*.

ANSWER: Virgin **Mary** [or **Madonna**, or the **Virgin**; accept *The Assumption of the **Virgin*** or *The Assumption of **Mary***]

[H] This painting by El Greco shows St. John raising his hands towards heaven to the left of the canvas while angels cover naked figures in robes in the background. Picasso studied this painting while creating *Les Demoiselles d'Avignon*.

ANSWER: *The **Opening of the Fifth Seal*** [or *The **Fifth Seal of Apocalypse*** or *The **Vision of Saint John*** or ***Profane Love***; do NOT accept or prompt on "*Sacred and Profane Love*," which is by Titian]

<Painting — Miles> [Ed. Venkateswaran]

3. **This ruler wrote a novel titled *Begone, Demons*, that features an allusion to the 9/11 attacks. Israel launched Operation Opera to destroy the Osirak nuclear reactor this ruler had bought from France. Apocryphally, this ruler commissioned a copy of the Quran written in his own blood. This ruler was captured while hiding in a "spider hole" during Operation Red Dawn. This ruler's first cousin was nicknamed (*)** "Chemical" Ali for his use of chemical weapons during the al-Anfal campaign against Kurds. This ruler's forces used the "Highway of Death" to retreat from a 1990 invasion of Kuwait. For 10 points, name this dictator of Iraq who was overthrown after the 2003 US invasion.

ANSWER: Saddam **Hussein** [or Saddam **Hussein** Abd al-Majid al-Tikriti; accept **Saddam**]

<World History — Athreya> [Edited]

3. For 10 points each, answer the following about Lin-Shu density wave theory:

[H] Density wave theory offers a solution to the winding problem of these structures, explaining how they maintain their shape without being distorted by differential rotation.

ANSWER: **spiral galaxies** [or **spiral galaxy**; accept **spiral arm**s; prompt on galaxies or galaxy]

[E] Under density wave theory, spiral arms are quasi-static – meaning the Solar System will one day leave its current place in this galaxy's Orion-Cygnus arm.

ANSWER: **Milky Way** Galaxy

[M] Density wave theory can also model these galactic features. Spiral galaxies with these features, like the Milky Way, lie on the lower branch of the Hubble tuning fork and are denoted "SB."

ANSWER: **bar**s [accept **bar**red spirals or **bar**red spiral galaxies]

<Astronomy — Sheffield> [Edited]

4. **In one work, this thinker compared himself to a midwife who helps other people give birth to ideas. This thinker claimed to be guided by a "divine sign" that warned him when he was about to do something wrong. This thinker compared his role of guiding his city by annoying it to a gadfly bothering a horse. The method of *elenchus* is also named for this thinker, whose tendency to feign (*)** ignorance in debate is called his "irony." After being accused of denying the gods and corrupting the youth, this thinker was sentenced to death by drinking hemlock. For 10 points, name this thinker who debates the people of Athens in many dialogues by his student, Plato.

ANSWER: **Socrates** ("SAW-cruh-teez")

<Philosophy — French> [Edited]

4. A poem about one of these events begins by addressing "God! giver of breath and bread." For 10 points each:
[E] Name these events. A poem about one of these events, "The Convergence of the Twain," describes "The Immanent Will that stirs and urges everything" and has the epigraph, "Lines on the loss of the 'Titanic.'"
ANSWER: **shipwreck**s [or **wreck**s; accept synonyms like a ship **sinking**; accept "The **Wreck** of the Deutschland"]
[M] "The Convergence of the Twain" was written by this poet. This author borrowed a line from Thomas Gray's "Elegy Written in a Country Churchyard" for the title of his novel *Far From the Madding Crowd*.
ANSWER: Thomas **Hardy**
[H] This poet wrote of a shipwreck in "The Wreck of the Deutschland," which was dedicated to five Franciscan nuns. This Catholic priest pioneered sprung rhythm and wrote highly alliterative verse, describing the "morning morning's minion" and "dapple-dawn-drawn Falcon" in "The Windhover."
ANSWER: Gerard Manley **Hopkins**
<Poetry — Yau> [Ed. French]

5. **One painting by this artist depicts a lone blue building whose bottom is obscured by railroad tracks. In another painting by this artist, a woman in a blue dress modeled after his wife Josephine leans against a wall while people nearby watch a movie. A window reflects two rows of ceiling lights behind a woman in a yellow hat holding a mug in this artist's (*)** *Automat*. In a painting by this artist, a large window separates a dimly-lit street from a brightly-lit building with no visible entrance. That painting by this artist shows three people and a bartender sitting in a diner late at night. For 10 points, name this American artist of *Nighthawks*.
ANSWER: Edward **Hopper**
<Painting — Narayan> [Ed. Venkateswaran]

5. An exhortation by this thinker condemns consumerism as in opposition to "integral ecology" in its section "An Ecological Dream." For 10 points each:
[H] Name this thinker who blamed pollution and climate change on a "throwaway culture" in his encyclical *Laudato si'*. The title of that encyclical comes from the Canticle of the Sun, which was written by this thinker's namesake.
ANSWER: Pope **Francis** [or Jorge Mario **Bergoglio**] (The Canticle of the Sun is by St. Francis of Assisi.)
[M] Francis reprised the themes of *Laudato si'* in his exhortation following a Synod for this region, which proposed a definition of "ecological sin." Many illegal fires in this region have been set by cattle ranchers.
ANSWER: the **Amazon** [or the Pan-**Amazon** Region or **Amazonia** or Pan-**Amazonia** or the **Amazon** rainforest]
[E] One of the benchmarks in the Laudato Si' Action Platform released in 2021 is divestment from this category of fuels formed by dead ancient plant matter. Oil, gas, and coal are in this category of fuel.
ANSWER: **fossil** fuels
<Current Events — French> [Edited]

6. **A poet who used this language lamented "the icy niche where men put you" in a sonnet addressed to her lover. Another poem in this language describes a "torpedo / from the ocean / depths" lying "among the market vegetables." The speaker laments, "love is so short, forgetting is so long," in a poem in this language, which was used to write (*)** "Ode to a Large Tuna in the Market." The phrase "in you everything sank!" is repeated throughout the last poem of a collection in this language, *Twenty Love Poems and a Song of Despair*. For 10 points, name this language used by Gabriela Mistral and Pablo Neruda, the official language of Chile.
ANSWER: **Spanish** [or **español**]
<Poetry — Yau> [Ed. French]

6. Lithium niobate is a crystal employed in circuits that use these particles instead of electrons. For 10 points each:
[E] Name these massless particles that carry the electromagnetic force. These particles are the quanta of light.
ANSWER: **photon**s
[M] The high error rate of the photonic circuits used in these devices has led critics to claim that these devices cannot attain "supremacy." These devices use bits that are capable of superimposing into more than two states.
ANSWER: **quantum computer**s [prompt on computers]
[H] Photonic circuits are used to implement a quantum computation model that "samples" from particles of this type. These particles are not affected by the exclusion principle and can thus exist in the same quantum state.
ANSWER: **boson**s
<Physics — Bowman> [Edited]

7. **In an event celebrated on "Loyalty Day," supporters of a leader of this country chanted "*alpargatas* yes, books no," in reference to the shoes worn by this country's poor. In 1947, the first lady of this country visited many European countries during her goodwill "Rainbow Tour." Working-class supporters of that woman's husband were called the (*)** "Shirtless Ones," or *descamisados*. The Mothers of the Plaza de Mayo gather on Thursdays to protest the children who disappeared during this country's Dirty War. This country fought the United Kingdom in a brief war for control of the Falkland Islands. For 10 points, name this country once led by Juan Perón with capital at Buenos Aires.
ANSWER: **Argentina** [or **Argentine** Republic or República **Argentina**]
<Li — World History> [Ed. Delot-Vilain]

7. The Catholic Church partially explains this doctrine with the concept of transubstantiation, while the Orthodox Church leaves it unexplained. For 10 points each:
[H] Name this doctrine, which holds that the bread and wine of the Eucharist actually become the body and blood of Christ. Many Protestant denominations reject this doctrine, holding that the transformation is merely symbolic.
ANSWER: **real presence** [or *praesentiae realis*]
[E] Christians believe that the Eucharist is a reenactment of this event, in which Christ shared a meal with his apostles before he died. This event is depicted in a painting by Leonardo da Vinci.
ANSWER: **Last Supper** [or **Lord's Supper** or **Mystical Supper** or **Secret Supper**; prompt on Supper]
[M] At the Marburg Colloquy, Martin Luther defended the real presence in a debate with this reformer, who denied it. This Swiss reformer invoked the doctrine of *sola scriptura* to defend a man who ate a sausage during Lent.
ANSWER: Huldrych **Zwingli** [or Ulrich **Zwingli**]
<Religion — French> [Edited]

8. **In a novel, an author mocks a "sub-sub-librarian" for painstakingly analyzing every biblical and literary allusion to these animals. In a prophecy, one of these animals is referred to as the hearse "not made by mortal hands." An "ungodly, god-like" man cries "from hell's heart (*)** I stab at thee!" as he dies fighting one of these animals. Earlier, that man offered a gold doubloon to anyone who spotted a particular one of these animals. At the end of a novel, one of these animals capsizes the *Pequod*, leaving the harpooner Ishmael stranded in a coffin. For 10 points, name this type of animal that terrorizes Captain Ahab in Herman Melville's *Moby Dick*.
ANSWER: **whale**s
<Long Fiction — Moon> [Ed. Orr]

8. A 2021 paper in the *American Political Science Review* by Alrababa'h, et al. claims that Mohamed Salah's arrival to a Premier League club in this city was followed by reduced hate crime and Islamophobia. For 10 points each:
[M] Name this Merseyside city. Fans in this city created a chant calling Salah "a gift from Allah," but that club's fans are better known for their heartful renditions of the song "You'll Never Walk Alone."
ANSWER: **Liverpool** [accept **Liverpool** F.C. or **Liverpool** Football Club]
[E] This American basketball player is a partial owner of Liverpool F.C. This small forward played in eight consecutive NBA Finals, split between the Heat and the Cavaliers, before moving to the Lakers in 2018.
ANSWER: LeBron **James** [or **LeBron** James]
[H] Liverpool was one of the twelve clubs across Europe that announced this would-be breakaway league and would have become permanent members of it. This proposed league soon dissolved after backlash from fans.
ANSWER: European **Super League** [or The **Super League** or **ESL**]
<Pop Culture — Condron> [Edited]

9. **The lustre ("luster") variety of these works were developed in the Islamic world as a substitute for gold gilding. Works of this type from the *Chenghua* era depicting chickens feature vivid red and greens achieved through the *doucai* ("doh-tsai") technique. Imperfections in these works are highlighted with metallic powder in the kintsugi ("KEEN-tsoo-ghee") method. Mass production of these works can be achieved with the slipcasting. Works of this type produced at (*)** *Jingdezhen* ("jing-duh-juhn") used cobalt glaze to achieve a distinctive blue and white coloring. The term "throwing" refers to the shaping of these works by hand on a rapidly spinning wheel. For 10 points, name these works made of materials like clay and porcelain.
ANSWER: **pottery** [accept **ceramic**s or **ware**s; accept **porcelain** before mention; prompt on <u>vase</u>s or <u>cup</u>s or <u>bowl</u>s or <u>plate</u>s by asking "what more general type of artworks do they exemplify?"]
<Misc. Art — An> [Ed. Ma]

9. A leader of this country used the term "salami tactics" to describe the method by which the Smallholders' Party and other enemies were defeated. For 10 points each:
[H] Name this country. Mátyás Rákosi ("MAH-tahsh RAH-koh-shee") was ousted three months before the beginning of an anti-Soviet revolution which saw Imre Nagy ("Nahj") rise to power in this country.
ANSWER: **Hungary** [or **Magyarország**; accept **Hungarian** People's Republic or **Magyar** Népköztársaság]
[M] Rákosi's position in Hungary faltered after this 1956 address denouncing Joseph Stalin was delivered at the 20th Congress of the Communist Party of the Soviet Union.
ANSWER: Khrushchev's **Secret Speech** [or "**On the Cult of Personality and Its Consequences**"]
[E] After Nagy replaced Rákosi as Prime Minister, Hungary briefly withdrew from the Pact named for this city, the capital of Poland.
ANSWER: **Warsaw** [or Capital City of **Warsaw** or **Warszawa**]
<European History — Condron> [Edited]

10. **James Dwight Dana wrongly posited that these features result from the collapse of geosynclines ("gee-oh-SIN-kleins") as the Earth contracts. Large-scale tensional forces can create the fault-block type of these features. These features often form through the process of orogeny ("aw-RAJ-uh-nee"). Cloud formation is induced by these features via orographic (*)** lift. These features create arid regions on their leeward sides called rain shadows. A biome called the alpine tundra occurs on these features above the tree line. For 10 points, name these landforms found in "ranges" like the Himalayas and the Rockies.
ANSWER: **mountain**s [accept **mountain** ranges or fault-block **mountain**s or folded **mountain**s or volcanic **mountain**s; prompt on <u>volcanoe</u>s or <u>orogen</u>s or <u>orogenic</u> belts; do NOT accept or prompt on "hills"]
<Earth, Ocean, and Atmospheric Sciences — Yin> [Edited]

10. In this novel, an aristocrat releases fireflies to illuminate a woman hidden by a curtain, thus entrancing his half-brother. For 10 points each:
[M] Name this 11th-century novel centered on the title "Shining Prince," who supposedly dies in the blank chapter "Vanished Into the Clouds." Earlier, this novel's protagonist marries Lady Aoi, the daughter of the Minister of the Left.
ANSWER: The **Tale of Genji** [or **Genji monogatari**]
[E] *The Tale of Genji* describes the Heian-period court life of this country. Jun'ichirō Tanizaki translated *The Tale of Genji* into the modern form of this country's language.
ANSWER: **Japan** [or **Nihon**-koku or **Nippon**-koku]
[H] Genji kidnaps this ten-year-old girl after falling in love with her. This niece of Lady Fujitsubo eventually dies, leaving Genji grief-stricken.
ANSWER: **Murasaki**
<Long Fiction — Lin> [Edited]

11. **A controversial trial following an event in this state resulted in the execution of August Spies. The mayor of this state's largest city, Carter Harrison, was assassinated during an event in this state whose layout was designed by architect Daniel Burnham. Grover Cleveland sent troops to put down a strike in this state that was led by Eugene Debs and the American Railway Union. The (*)** Haymarket Affair and Pullman Strike both took place in this state where Jane Addams established Hull House. Mrs. O'Leary's cow apocryphally started a Great Fire in this state's largest city 1871. For 10 points, the 1893 World's Fair took place in what state's city of Chicago?
ANSWER: **Illinois**
<US History — Prabhakar> [Edited]

11. Choruses sung by soldiers changing guards, street children, and cigarette girls precede this aria, during which the soloist flirts with a crowd of men. For 10 points each:
[H] Name this aria that begins with the soloist singing a chromatically descending melody starting on the note D over a continuous cello ostinato. In this aria, the chorus repeatedly sings "Prends garde à toi" ("prawn gard ah twa").
ANSWER: **Habanera** [or "**Love is a rebellious bird**" or "**L'amour est un oiseau rebelle**"]
[E] The Habanera is sung by this opera's title character before she tosses her flower at Don José. Escamillo ("eh-skah-MEE-yo") introduces himself in the "Toreador Song" in this opera by Georges Bizet ("bee-ZAY").
ANSWER: *Carmen*
[M] The Habanera is adapted in the first moderato movement of the *Carmen Fantasy*, a work for this instrument by the Spanish virtuoso Pablo de Sarasate. Itzhak ("eets-HAWK") Perlman and Jascha Heifetz ("YAH-sha HIGH-fits") also played this instrument.
ANSWER: **violin**
<Classical Music — An> [Edited]

12. **Friedrich Fröbel, who invented kindergarten, names a star made of this material used to teach children geometry. Refugees from the ship *Golden Venture* popularized using interlocking triangular modular forms of this material, prototypically to make swans. Imitations of gold and silver (*)** yuanbao ingots made of this material are used at funerals. The tradition of making 1000 of one item from this material to grant a wish originates from the story of Sadako Sasaki, a Hiroshima survivor. "Valleys" and "mountains" are types of steps for manipulating this material, which is used to make iconic cranes. For 10 points, name this material which is folded in the art of origami.
ANSWER: **paper** [or origami **paper** or **kami** or **zhi**]
<Other — Gray> [Edited]

12. For 10 points each, answer the following about the evolutionary benefits of honest signalling:
[E] The large, blue and green eye-spotted tail plumage of these male birds demonstrates the handicap principle, since it's costly to maintain and thus provides an honest signal of fitness to potential mates.
ANSWER: **peacock**s [accept **peafowl**]
[M] In the green beard effect, genes encoding this behavior also provide honest signals in the form of perceptible physical traits. This term refers to any action an organism takes to increase another's fitness at the cost of its own.
ANSWER: **altruism** [or **altruistic** behavior]
[H] Organisms with strong defence mechanisms mutually benefit from this process, in which they develop the same aposematic warning patterns in order to honestly signal their danger to predators.
ANSWER: **Müllerian mimicry** [prompt on mimicry]
<Biology — Sheffield> [Edited]

13. **The last track on this album's first side concludes with rising white noise over guitar arpeggios that abruptly cut into silence. Roadie Mal Evans played the anvil in the chorus of a song on this album about a homicidal maniac who kills a girl studying "pataphysical science." Most of this album's second side is a medley of short songs such as (*)** "Mean Mr. Mustard" and "Polythene Pam." The first track on this album states, "one and one and one is three" and opens with the lyric, "Here come Old Flat-Top." For 10 points, "Come Together" and "Here Comes the Sun" appear on what Beatles album, whose cover depicts the four bandmembers crossing the title street?
ANSWER: ***Abbey Road***
<Misc. Art — French> [Edited]

13. One story by these people sees a straw, a coal, and a bean meet an unfortunate end after the coal burns up the straw and the bean splits itself laughing. For 10 points each:
[E] Name these German brothers who collected many fairy tales in their *Children's and Household Tales.* That collection includes the stories of Cinderella and The Little Red Riding Hood.
ANSWER: The Brothers **Grimm**
[M] The title girl of this story is named after a vegetable grown in a witch's garden that her mother craved while she was pregnant. In this story, a man is blinded after being thrown into a thorn bush from a tower.
ANSWER: "**Rapunzel**"
[H] In one story, a girl who guards these animals with Conrad chants, "Falada, Falada, thou art dead," daily. In another story, Simpleton receives a golden one of these animals, whose magical abilities make a princess laugh for the first time.
ANSWER: **geese** [or **goose**; accept "The **Goose Girl**" or "The **Golden Goose**"]
<Other Literature — An> [Edited]

14. **In a novel, this author wrote a chapter framed as a question-and-answer catechism about a character's return to his home on Eccles Street. The initials "H.C.E" recur in another novel by this author that begins with the line, "riverrun, past Eve and Adam's." While on a religious retreat, the title character of a novel by this author becomes repentant after a fiery sermon about hell given by (*)** Father Arnall. This author of *Finnegans Wake* wrote a novel set entirely on June 16 which centers on Stephen Dedalus and Leopold Bloom's journeys around Dublin. For 10 points, name this Irish author of *A Portrait of the Artist as a Young Man* and *Ulysses*.
ANSWER: James **Joyce** [or James Augustus Aloysius **Joyce**]
<Long Fiction — Lin> [Ed. Orr]

14. Rumors that delegates at this convention seriously considered the secession of New England have been strongly contested by modern historians. For 10 points each:
[H] Name this 1814-1815 convention whose delegates called for the passage of several constitutional amendments, such as removing the three-fifths compromise, and opposed the War of 1812.
ANSWER: **Hartford** Convention
[M] The attendees of the Hartford Convention were largely New Englanders who belonged to this political party, which lost much of its influence after the convention. This party opposed the ruling Democratic-Republicans.
ANSWER: **Federalist** Party
[E] The Hartford Convention also opposed the Embargo Act of 1807, which was signed by this third president. This president's successor, James Madison, was in office during the proceedings of the Hartford Convention.
ANSWER: Thomas **Jefferson**
<American History — Athreya> [Ed. Delot-Vilain]

15. **This element's cationic form can be stabilized by a solution of fluorosulfuric acid and antimony pentafluoride nicknamed "magic acid." This is the heavier of the two elements that are moved during an alkyl shift. This element and hydrogen are the only two not explicitly labeled in bond-line notation. Atoms of this element are connected to (*)** each other only by single bonds in saturated fats. This element's ability to form 4 bonds makes it ideal for forming the backbone of polymer chains. Organic compounds are defined by the presence of this element. For 10 points, name this element with atomic number 6, denoted C.
ANSWER: **carbon** [prompt on **C**]
<Chemistry — Schwartz> [Edited]

15. This neighborhood's Cathedral-Basilica of Saint Louis is located near Jackson Square. For 10 points each:
[H] Name this neighborhood south of Tremé. After the nearby red light district, Storyville, was closed in the 1920s, this neighborhood's Bourbon Street became the center of its city's nightlife.
ANSWER: the **French Quarter** [or the **Quarter** or **Vieux Carré**]
[E] The French Quarter is part of this Louisiana city on the Mississippi River. The French Quarter was largely spared when this city was devastated by Hurricane Katrina.
ANSWER: **New Orleans** [or **Nola** or **Nawlins**; prompt on the Big Easy]
[M] Another remnant of Louisiana's French heritage is its division into these regions, the equivalent of counties. In the Catholic Church, a diocese is divided into these regions, which are each presided over by a priest.
ANSWER: **parish**es [accept civil **parish** or eccesiastical **parish** or **parish** priest]
<Geography — French> [Edited]

16. **A ghost tells this figure that men who have seven sons live like gods in the underworld. This figure uses his clothes as a sail to cross the Waters of Death after killing the Stone Things that would have taken him across. By tying stones to his feet, this figure is able to reach an underwater magical (*)** herb that is later stolen by a snake. After this figure rejects a goddess's advances, that goddess sends the Bull of Heaven to attack his city. This figure fashions a gate out of wood from the Cedar Forest after defeating the giant Humbaba with his friend Enkidu. For 10 points, name this king of Uruk who is the main character of a Sumerian epic.
ANSWER: **Gilgamesh** [or **Bilgamesh** or **Bilgames**; accept *The Epic of **Gilgamesh*** or *The Epic of **Bilgamesh*** or *The Epic of **Bilgames***]
<Mythology — An> [Edited]

16. The main character of this film interrogates an accused witch about Satan, saying, "I want to ask him about God. He, if anyone, must know." For 10 points each:
[H] Name this 1957 film about the knight Antonius Block's search for meaning during the Black Plague. In this film, Block is portrayed by Max von Sydow, and he plays a game of chess to extend his life.
ANSWER: The **Seventh Seal**
[E] Block plays that game of chess against a personification of this thing. The final scene of the film draws on the medieval *Danse macabre* motif, where the inevitability of this thing is represented by dancing skeletons.
ANSWER: **death** [accept **Death**]
[M] *The Seventh Seal* was directed by this director, who also directed *Wild Strawberries*. The nurse Alma takes care of the actress Elisabet Vogler after she stops talking in this Swedish director's film *Persona*.
ANSWER: Ingmar **Bergman** [do NOT accept or prompt on "Ingrid Bergman"]
<Film — Sheffield> [Ed. French]

17. **After his former boss shows this character the first dollar he made, this character breaks the glass and uses it to buy a soda from a vending machine. This character spends an episode obsessively hunting a fly down after falling while trying to swat it. This character keeps the eye of a pink (*)** teddy bear that falls into his pool from a plane crash. Gus, the proprietor of the fried chicken chain *Los Pollos Hermanos*, hires this character through his lawyer Saul Goodman. After his cancer diagnosis, this character helps Jesse Pinkman make a product nicknamed "Blue Sky." For 10 points, name this chemistry teacher turned meth kingpin from *Breaking Bad*.
ANSWER: Walter **White** [or **Walt**er Hartwell White; accept **Heisenberg**]
<Pop Culture — Sheffield> [Edited]

17. Clayton Alderfer extended one of this psychologist's models by developing the ERG theory. For 10 points each:
[M] Name this humanistic psychologist who posited the "hierarchy of needs" in "A Theory of Human Motivation."
ANSWER: Abraham **Maslow**
[E] Maslow criticized behaviorism for using this general class of beings as simplified models of human motivation. Psychologists sometimes use members of this biological kingdom, such as monkeys and rats, as test subjects.
ANSWER: **animals**
[H] Illustrations of Maslow's hierarchy of needs often split the pyramid into two larger sections, with self-actualization at the top of the upper section and physiological needs at the bottom of the lower section. Give the name of *either* large section.
ANSWER: **growth** OR **deficiency** needs [accept **d-needs** in place of deficiency]
<Psychology — Condron> [Edited]

18. *Trichomonas* ("trick-uh-MOH-nass") **uses a modified form of this organelle called a hydrogenosome ("hydrogen-uh-sohm") to anaerobically oxidize a 3-carbon compound to produce hydrogen gas. This organelle breaks down short-, medium-, and long-chain fatty acids into acetyl-CoA via beta oxidation. The initiation of the caspase cascade that causes apoptosis is triggered by the release of (*)** cytochrome c from the inner membrane of this organelle. This organelle's double membrane and maternally inherited DNA provide evidence that, like chloroplasts, this organelle evolved via endosymbiosis. For 10 points, the electron transport chain and citric acid cycle produce ATP within what "powerhouse of the cell"?
ANSWER: **mitochondrion** [or **mitochondria**; accept **mitochondrial** inner membrane]
<Biology — Yin> [Ed. Schwartz]

18. The use of mass internment in response to this rebellion is discussed in Caroline Elkins' 2005 book *Imperial Reckoning*. For 10 points each:
[H] Name this event that saw the Land and Freedom Army fight against British rule under the leadership of Dedan Kimathi and General China. The Kapenguria Six were put on trial for being the purported ringleaders of this event.
ANSWER: **Mau Mau** uprising
[E] The Mau Mau uprising took place in this east African country. Many British colonists settled in this country's capital of Nairobi during the colonial period.
ANSWER: **Kenya** [or Republic of **Kenya**]
[M] This Ugandan dictator participated in the Mau Mau uprising as an officer in the King's African Rifles. This dictator was forced out of power after a failed invasion of Tanzania in the Kagera War.
ANSWER: Idi **Amin** Dada
<World History — Prabhakar> [Edited]

19. **Due to rumors that she kept this city's prefect, Orestes, from reconciling with its bishop, the pagan philosopher Hypatia was killed in this city by a Christian mob. At the Council of Ephesus, the primary opponent of Nestorianism was that bishop from this city, Cyril. Until it was destroyed by Theophilus, this city was home to the main temple of the cult of Serapis. After the wars of the (*)** Diadochi, this city became the capital of the Ptolemaic Kingdom. A series of earthquakes destroyed a structure near this city on the island of Pharos, one of the wonders of the ancient world. For 10 points, name this Egyptian city once home to a lighthouse and a Great Library.
ANSWER: **Alexandria**
<European History — French> [Edited]

19. James Baldwin described first appreciating Shakespeare after hearing this character's lines, "How many ages hence / Shall this our lofty scene be acted over, / In states unborn and accents yet unknown!" For 10 points each:
[H] Name this character. Earlier, this character tells another that "the fault… is not in our stars, / But in ourselves, that we are underlings."
ANSWER: **Cassius** (Baldwin's essay is called "Why I Stopped Hating Shakespeare.")
[E] Cassius convinces Brutus to help assassinate the title Roman general in this tragedy by William Shakespeare.
ANSWER: *Julius Caesar* [or The Tragedy of *Julius Caesar*]
[M] This character calls Cassius and Brutus traitors in a passage lamenting the stab wounds on Caesar's corpse. This character commands, "Friends, Romans, countrymen, lend me your ears" to begin his oration at Caesar's funeral.
ANSWER: **Antony** [or Mark **Antony**]
<Drama — Condron> [Ed. French]

20. **Christopher Pearce Cranch illustrated one of this author's metaphors as an armless, long-legged figure wearing a suit and towering over a hilly landscape. Cranch also praised a speech in which this author recommended turning away from the "courtly muses of Europe" to Harvard's Phi Beta Kappa Society. In an essay, this author of "The American Scholar" described how "all mean egotism vanishes" before comparing himself to a (*)** "transparent eye-ball." In another essay, this author claimed that "a foolish consistency is the hobgoblin of little minds." For 10 points, name this friend of Henry David Thoreau, a Transcendentalist author who wrote *Nature* and *Self-Reliance*.
ANSWER: Ralph Waldo **Emerson**
<Other Literature — Lin> [Ed. Condron]

20. This search algorithm works by recursing down a tree, choosing to go left or right at each node based on whether that node's value is greater than or less than the value being searched for. For 10 points each:

[M] Name this search algorithm which is much faster than linear search. In addition to its tree version, this algorithm can also operate on a sorted array by repeatedly splitting the searched area in half.

ANSWER: **binary** search

[E] Appropriately, given its name, binary search only works in trees with at most this many children per node. This is also the number of possible values of a single bit.

ANSWER: **two**

[H] Binary search has time complexity big-O of this function of the number of nodes. That's because binary search operates on one node per tree level, and binary tree height is at most this function of the number of nodes.

ANSWER: **logarithm** [or base-two **logarithm** or **log** or **log n** or **log**arithm with any other base; accept **big-O log** n]

<Computer Science — Gray> [Edited]