1. Under Chindasuinth (CHIN-dah-swinth), this group set up the Liber ludicorum law code. They were converted to Catholicism under Reccared I, who moved them away from Arianism. They were defeated at the Battle of Vouille (voo-YAY) by (*) Clovis I while staying in Gaul, after they set up a capital at Toulouse. This tribe controlled medieval Spain up until the Islamic conquest. This tribe, under Alaric I, sacked Rome in 410. For 10 points, name this branch of a Germanic tribe found to the west of the Ostrogoths.
ANSWER: Visigoths [prompt on Goths]
2. This phenomenon's namesake waves are being searched for by the LIGO experiment. The equivalence principle equates inertial mass to mass caused by this phenomenon. An experiment that measured a constant of this force used two lead balls and a torsion balance, and was performed by Henry Cavendish. In general relativity, it is described as spacetime curvature, and acceleration due to ${ }^{*}$ ) it on Earth is 9.8 meters per second squared. For 10 points, name this solely attractive fundamental force that arises between massive objects.
ANSWER: gravity [or gravitational force]
3. This country's Jack Hills contain minerals from the Hadean Eon. Some ancient plant species comprise this country's Gondwana Rainforests. Its Top End includes Kakadu National Park, which is part of the Arnhem Land region. Much of this country is drained by the (*) Murray and Darling Rivers. In this country, Kata Tjuta lies west of a "island mountain" called Uluru near Alice Springs. Mount Kosciuszko (COZ-ee-OO-skoh) lies in this country's Great Dividing Range. For 10 points, name this country, home to Ayers Rock.
ANSWER: Commonwealth of Australia
4. This book says that Sigmund Freud's theories "settled everywhere, like fine volcanic ash." This book decries the "comfortable concentration camp," and it sparked the "second wave" of the social movement that it advocated. This book attempted to address 'the (*) problem that has no name" and was based in part on the author's interviews with fellow Smith College graduates-turned-housewives. For 10 points, name this 1963 book that examined women's attempts to find fulfillment in post-war America, written by Betty Friedan.
ANSWER: The Feminine Mystique
5. This prophet convinces the widow of Zarephath to give him the last of her food. This prophet warned that those who had stolen Naboth's vineyard would be eaten by dogs. He's not Moses, but he appears alongside Jesus during the Transfiguration. According to First Kings, this man's prayers relieved a (*) drought which could not be stopped by the prophets of Ba'al. For 10 points, name this Old Testament prophet, the nemesis of Jezebel, whose similarly named successor watched as he rode a chariot of fire in lieu of dying.
ANSWER: Elijah [or Elias; do not accept or prompt on "Elisha"]
6. The Yamasee War took place in what is now this state. Eliza Lucas pioneered the growing of indigo as a cash crop in this colony, whose largest city had the largest Jewish population in America at the time of the Revolution. This state's first governor was John Rutledge, the second Chief Justice, and it was the site of battles at $\left({ }^{*}\right)$ Kings Mountain and Cowpens. For 10 points, identify this colony, home to Charles Town, which split in 1719 from a similarly named northern neighbor.
ANSWER: South Carolina
233-14-86-10106
7. This disease can be detected in utero with a combination of testing for the protein PAPP-A and a Nuchal scan. Patients suffering from this condition display white spots on the iris, known as Brushfield spots, and may also display a single crease across their palms. Epicanthic folds in sufferers of this condition yield (*) almond-shaped eyes, and many adults suffering from this condition ultimately display Alzheimer's symptoms. For 10 points, name this common genetic disorder which results in mental retardation, caused by an extra copy of chromosome 21.
ANSWER: Down's syndrome [or trisomy 21 until "chromosome 21 " is read]
8. A woman in one of this man's novels repeats a prayer from The Way of a Pilgrim continuously after being left alone by her boorish boyfriend Lane. The narrator of that novel ends it by saying, "Don't ever tell anybody anything. If you do, you start missing everybody." This author of (*) Franny and Zooey wrote about the Glass family in several of his stories, including "A Perfect Day for Bananafish," and he also created the Pencey Prep dropout Holden Caulfield. For 10 points, name this author of The Catcher in the Rye.
ANSWER: Jerome David Salinger
9. A conversation between Samuel Goldenberg and Schmuyle is depicted in one movement of this piece, which uses a saxophone solo to represent a troubadour singing before acastle. Bars of 5/4 and 6/4 time alternate in the recurring (*) "Promenade" movement of this suite, which was famously orchestrated by Maurice Ravel. "The Hut on Fowl's Legs" and "The Great Gates of Kiev" are two movements of this suite, based on a set of Viktor Hartmann paintings. For 10 points, name this suite composed by Modest Mussorgsky.
ANSWER: Pictures at an Exhibition
10. In a novel by this author, Laurent and the title character are spared the revelation that they drowned Camille by Madame Raquin's sudden illness. After Grandmorin is murdered, Jacques Lantier dies while driving a train in another of his novels. Jacques' brother (*) Etienne leads a coal miners' strike in an 1885 novel which is a part of this author's Rougon Macquart series. For 10 points, name this French naturalist author of Germinal who defended Alfred Dreyfus with the letter "J'accuse." ANSWER: Emile Zola

190-14-86-10110
11. This man led a prison called La Cabana, where he executed between fifty and one hundred people. While in medical school, hh took a trip to a leper colony in Peru with Albert Granado, as detailed in his memoir The (*) Motorcycle Diaries. He became the second-in-command during the 26th of July Movement to remove Fulgencio Batista from power. This author of the tract Guerrilla Warfare aided the Castros in the Cuban Revolution. For 10 points, name this Argentine Marxist revolutionary who became a popular poster subject after he was killed in Bolivia.
ANSWER: Che Guevara [or Ernesto Guevara]
12. One artist from this movement, Robert Indiana, arranged the letters of the word "love" in a square in several different media. Another member of this movement painted a woman exclaiming, 'I'd rather sink than call Brad for help!'"; that painting, Drowning Girl, was created with his characteristic Ben-Day dots. One member of this movement depicted a burning plane in (*) Whaam!, while another created silkscreens of Mao Zedong. For 10 points, name this mid-20th century art movement represented by Roy Lichtenstein and Andy Warhol, who replicated everyday objects.
ANSWER: Pop Art
13. In the set-theory construction of the natural numbers, this number is a subset of all other natural numbers. This number is the sum for $n$ greater than one of the $n$-th roots of unity. Odd functions always intersect the line $y$ equals $x$ where $x$ has this value. Roots of a polynomial are inputs such that the polynomial's $\mathbf{~}^{*}$ ) output equals this number. When positive numbers are raised to the power of this number, the result is one. For 10 points, give this additive identity, division by which is generally forbidden.

ANSWER: zero [or the empty set until "roots of unity" is read]
14. This god disguised himself as Harbard, an insulting ferryman, to fling insults at his son. This god gives the wolves Geri and Freki his food. This god owns the seat Hlidskjalf, from which he can see all lands. With his brothers Vili and Ve this god killed Ymir. At Ragnarok, this god will be swallowed by ${ }^{(*)}$ Fenrir. This god obtained wisdom from the well of Mimir, but as a result has only one eye. For 10 points, name this husband of Frigg, the chief Norse god.
ANSWER: Odin [accept Wotan]
15. Along with hunting and heraldry, this is one of the three activities laid out in The Book of Saint Albans. Frederick II of Hohenstaufen wrote a treatise on this activity in De Arte Venandi cum Avibus. Anne Boleyn's crest features the animal used in this activity. An (*) "austringer" is an expert of this activity, and beginners in this discipline often use the red-tailed hawk. This sport was popular among noblemen in the Middle Ages. For 10 points, name this activity in which hunting is performed by a trained bird of prey.
ANSWER: falconry [or hawking before "hawk" is mentioned; prompt on hunting until it is read]
16. One of this author's characters notes that she "would never, in her honestest moments, have confessed to herself that she disliked" the main character. In that story, he wrote about Mrs. De Ropp caring for the terminally ill Conradin, who invents a religion centering on the title (*)
polecat-ferret. This author's most famous work ends with the sentence "Romance at short notice was her specialty," in which Vera claims to Framton Nuttel that her father died in a bog. For 10 points, name this British short story author of "Sredni Vashtar" and "The Open Window."
ANSWER: Saki [or Hector Hugh Munro]
17. In one opera by this man, Ivan saves the Princess after killing the antagonist, whose death is hidden in his daughter's tear. This composer of Kashchey the Deathless also composed an opera in which the title bird attacks King Dodon after the Astrologer is beaten. This composer of The (*) Golden Cockerel included a solo violin playing ascending and descending chromatic scales as an interlude at the end of Act III of his The Tale of Tsar Saltan, representing a buzzing insect. For 10 points, name this composer of Flight of the Bumblebee.
ANSWER: Nikolai Rimsky-Korsakov
18. This man was accused by his enemies of belonging to the Khlysty (KLISS-tee), possibly because of the time he spent at the monastery at Verkhoture. Another set of rumors about this man caused him to be beaten by the monk Iliodor and bishop Hermogen. This man's presence was opposed by the prime minister, Pyotr Stolypin. This man visited the house of Felix (*) Yusupov, where he was given poisoned wine and cakes that failed to kill him. This man rose to power for his calming effect on the hemophiliac Alexis. For 10 points, name this mystic advisor to Alexandra and Nicholas II.
ANSWER: Grigory Yefimovich Rasputin [or Grigory Yefimovich Novykh]
023-14-86-10118
19. A character in this novel was murdered while writing his treatise on "The Truth About Native Crime." Mr. Carmichael agrees to argue a case in court pro deo in this novel, and another character travels to the city after receiving a letter from Msimangu. That character finds that his sister (*) Gertrude has become a prostitute and that his son Absalom is to be executed for the murder of Arthur Jarvis. For 10 points, name this novel in which Stephen Kumalo travels to Johannesburg, written by Alan Paton.
ANSWER: Cry, the Beloved Country
20. Brownian motion was discovered in this type of system. These systems can classified as lyophobic or lyophilic. These systems can be stably formed in peptization, or formed through large clusters in flocculation. These systems scatter incident light in the Tyndall effect, and they are composed of (*) continuous and dispersed phases. For 10 points, identify this type of mixture in which smaller particles are dispersed throughout a medium, examples of which include aerosols and emulsions.
ANSWER: colloids [or colloidal system; prompt on aerosol]
21. One of this military leader's campaigns ended in defeat, despite winning a victory over the French at Janiculum Hill. He served as a naval captain for the Republic of Rio Grande so Sul before fighting for the independence of Uruguay. This man's soldiers wore clothing made for slaughterhouses, leading them to be called (*) Redshirts. He led the Expedition of the Thousand against the Bourbon Kingdom of the Two Sicilies. For 10 points, name this "Hero of Two Worlds," an Italian soldier whose military conquest led to the reunification of Italy.
ANSWER: Giuseppe Garibaldi
22. If there is no aberration, any light traveling parallel to the principal axis that reflects from a mirror of this type will later pass through the focal point. An object placed beyond the focal length for a mirror of this type will form an inverted, real image. Because lenses of this type always produced a smaller, virtual images, those lenses are used to correct nearsightedness. Lenses of this type are thinner in the $\left({ }^{*}\right)$ middle than at the edges. For 10 points, identify this term that denotes a type of mirror opposite from convex.
ANSWER: concave mirror [or concave lens; or converging mirror; or diverging lens; prompt on converging; prompt on diverging]
23. A novel by this author opens with Gwendolyn Harleth losing money at a roulette table, and the title character saves Mirah Lapidoth from drowning before marrying her. In this author's first novel, Hetty Sorrel confesses to abandoning her illegitimate child to Dinah Morris. Dinah later marries the central character of that novel, a village carpenter. This novelist of Daniel (*) Deronda and Adam Bede wrote about the marriage of Edward Causabon and Dorothea Brooke in her most famous novel. For 10 points, name this female British author of Middlemarch.
ANSWER: George Eliot [or Mary Ann Evans]

1. This particle is released in isomeric transitions and spontaneous emission. For 10 points each:
[10] Identify this particle that transmits the electromagnetic force and is represented by a wavy line on Feynman diagrams.
ANSWER: photon
[10] The photon is assumed to have a value of zero for this quantity, which is related to energy by the factor of the speed of light squared.
ANSWER: rest mass [or invariant mass]
[10] The theory of photons was able to explain this phenomenon, in which light of a certain frequency allows a material's electrons to overcome the work function and be released.
ANSWER: photoelectric effect
234-14-86-10201
2. Atkinson and Shiffrin developed a multi-store model of this concept, which includes sensory, short-term, and long-term components. For 10 points each:
[10] Identify this psychological concept which refers to the encoding, storage, and retrieval of information.
ANSWER: memory
[10] George Miller proposed that the capacity of short-term memory is this "magical number, plus or minus two."
ANSWER: seven
[10] This strategy for taking advantage of the magic number in short term memory divides long streams of information into manageable components, which are each perceived as one item.
ANSWER: chunking
228-14-86-10202
3. Members of this phylum have tubular digestive systems, and the model organism C. elegans is a member of this phylum. For 10 points each:
[10] Name this phylum of roundworms.
ANSWER: nematodes [or Nematoda]
[10] The bodies of nematodes exhibit this kind of symmetry contrasts with radial symmetry.
ANSWER: bilateral symmetry
[10] Nematodes are members of this superphylum whose members' initial blastopore develops into the mouth, with the anus developing afterwards.
ANSWER: protostomes
4. This novel concerns a character who abandons a wife and child in Haiti and is eventually killed by Wash Jones after fighting in the Confederate army. For 10 points each:
[10] Name this novel in which Quentin Compson tells the story of Mississippi plantation owner Thomas Sutpen to his Harvard roommate Shreve.
ANSWER: Absalom, Absalom!
[10] Absalom, Absalom! is a novel by this stream-of-consciousness Southern author of As I Lay Dying. ANSWER: William Faulkner
[10] Quentin commits suicide in this other Faulkner novel, which is partially narrated by the mentally handicapped Benjy Compson. This novel takes its title from a line in Macbeth.
ANSWER: The Sound and the Fury
5. The B type of these data structures is a generalization of binary search ones and is commonly used in databases. For 10 points each:
[10] Name this data structure of connected nodes emerging from a root node. The end nodes without children are called leaf nodes.
ANSWER: trees
[10] This other data structure uses a namesake function to map keys to values in an associative array. ANSWER: hash table
[10] Hash tables need to account for these events that occur when different keys are mapped onto the same value.
ANSWER: collisions
014-14-86-10205
6. Sir George Solti discovered an incorrect metronome marking in the original score for this piece as he was preparing to record its second movement, "Game of Pairs." For 10 points each:
[10] Name this confusingly-titled Bela Bartok composition, whose penultimate "Intermezzo interroto" movement parodies a march tune from Shostakovich's Leningrad Symphony.
ANSWER: Concerto for Orchestra, Sz. 116, BB 123
[10] Another misleadingly-monikered classical composition, Eduard Lalo's Symphonie Espagnole, is not a symphony at all, but instead a concerto for this solo instrument played by Itzhak Perlman and Joshua Bell. ANSWER: violin
[10] A notable violin concerto in D major was written for Joseph Joachim by this German composer of a famous lullaby. He is the last of the "three B's."
ANSWER: Johannes Brahms
014-14-86-10206
7. This collection begins with a discussion of things which can be called into doubt. For 10 points each: [10] Identify this six-part treatise, which also posits that the body is like an unchanging piece of wax in that only our perception of its substance is what matters.
ANSWER: Meditations on First Philosophy [or Meditations Metaphysiques; or Meditations de prima philosophia]
[10] In another tract by the author of the Meditations, Discourse on Method, the author makes this claim about the only thing that cannot be doubted.
ANSWER: "I think, therefore I am" [or Cogito ergo sum; or "Je pense, donc je suis"]
[10] Meditations on First Philosophy and the Discourse on Method were both written by this seventeenth-century French philosopher who invented a coordinate system.
ANSWER: Rene Descartes
8. As this novel opens, Billy Bones is staying at the Admiral Benbow Inn. For 10 points each:
[10] Name this novel narrated by Jim Hawkins, who teams up with Dr. Livesey to defeat a notoriously cruel pirate, Long John Silver.
ANSWER: Treasure Island
[10] This author of Treasure Island also created a man who alternately takes the personalities of Dr. Jekyll and Mr. Hyde.
ANSWER: Robert Louis Stevenson
[10] This other character from Treasure Island is a marooned former member of Captain Flint's crew. He aids Jim for a chance to return home and is first seen really craving some cheese.
ANSWER: Ben Gunn [or Ben Gunn]
9. This country is currently led by Joseph Kabila. For 10 points each:
[10] Name this African country once led by Mobutu Sese Seko under the name "Zaire." The short-lived state of Katanga broke away from it in 1960.
ANSWER: Democratic Republic of the Congo [prompt on the Congo; do not accept or prompt on "Republic of Congo"]
[10] Mobutu overthrew Joseph Kasavubu and this man, the country's first prime minister, who aroused CIA ire for his Communist sympathies.
ANSWER: Patrice Lumumba
[10] Prior to its independence, the Democratic Republic of the Congo was the site of "atrocities" named for this natural resource, which is produced from the Hevea brasiliensis tree.
ANSWER: rubber [prompt on latex]
10. This family's political strategy was summarized with the phrase "Let others wage war, but thou, O happy Austria, marry." For 10 points each:
[10] Name this dynasty, begun in Austria by Rudolph, that ruled the Holy Roman Empire almost continuously from 1440 on.
ANSWER: House of Habsburg
[10] The Bourbons replaced the Habsburgs as the ruling dynasty in this country after the death of Charles II. Charles's death led to a thirteen year war over succession that was ended by the Treaty of Utrecht.

ANSWER: Spain [or War of Spanish Succession]
[10] Years of politically motivated marriages led to numerous genetic defects and to this feature of Habsburgs' faces being especially prominent.
ANSWER: chin [or jaw; or underbite]
121-14-86-10210
11. For 10 points each, name these Roman poets.
[10] Like Hesiod, this poet described several ages of man and the nature of agriculture in his Georgics. The title character marries Lavinia and kills King Turnus in his epic about a refugee from Troy, the Aeneid. ANSWER: Virgil [or Publius Vergilius Maro]
[10] Virgil helped this other poet befriend Maecenas, a patron of art under Emperor Augustus. This poet of some Odes coined the term "in medias res" in his Ars Poetica.
ANSWER: Horace [or Quintus Horatius Flaccus]
[10] This first century Iberian poet is known for his twelve books of humorous and satirical Epigrams, including one that describes the "things that make life happy".
ANSWER: Martial [or Marcus Valerius Martialis]
12. An orange one of these objects is covered with ants in the bottom-left corner, while another hangs on a tree branch. For 10 points each:
[10] Name these objects. In the center of the painting, one of these objects lays atop a white formless animal.
ANSWER: melting watches in The Persistence of Memory [or clocks in place of watches]
[10] This Spanish surrealist painted The Persistence of Memory.
ANSWER: Salvador Dali
[10] Dali painted The Ghost of this person, Which Can Be Used As a Table. Only thirty or so of this man's paintings survive, including The Art of Painting and The Milkmaid.
ANSWER: Jan Vermeer [or Vermeer of Delft; or Johannes Vermeer]
190-14-86-10212
13. In this lab technique, increasing the number of theoretical plates will improve the separation efficiency, unless you have an azeotrope. For 10 points each:
[10] Name this technique that involves boiling a mixture in a namesake column, then condensing the vapor at the top of the column into another flask. It's used to purify ethanol.
ANSWER: distillation
[10] Distillation separates substances based on volatility, which is directly related to this quantity symbolized "p-star". The Clausius-Clapeyron equation gives it as a function of temperature.
ANSWER: vapor pressure [prompt on "pressure"]
[10] When a superheated vapor is cooled, condensation first occurs at this temperature. At this point, the partial pressure equals the vapor pressure.
ANSWER: dew point
14. For 10 points each, name these authors of novels set in Chicago.
[10] This author wrote about a man who writes many unsent letters and feuds with his wife Madeline in Herzog. He also wrote The Adventures of Augie March and Ravelstein.
ANSWER: Saul Bellow
[10] This African-American author set much of his work in Chicago, including Native Son and the later part of his autobiography Black Boy.
ANSWER: Richard Wright
[10] This author set his Jennie Gerhardt in Chicago. One of his most famous characters becomes the lover of Charles Drouet after moving to Chicago.
ANSWER: Theodore Dreiser
233-14-86-10214
15. As of 2013, this college football conference has won the past seven BCS National Championships. For 10 points:
[10] Name this conference which added Texas A\&M and Missouri to its membership in 2012.
ANSWER: Southeastern Conference [or SEC]
[10] This college football team has won the past two BCS National Championships, most recently defeating Notre Dame 42-14.
ANSWER: Alabama [or Alabama Crimson Tide]
[10] This New Orleans college was a founding member of the SEC, but left in 1966. They are currently members of Conference USA.
ANSWER: Tulane Green Wave [prompt on Green Wave]
16. Her first performance was in A Fairy Tale, choreographed by teacher and longtime collaborator Marius Petipa. For 10 points each:
[10] Name this Russian ballerina who toured the world in the early twentieth century.
ANSWER: Anna Matveyevna Pavlova
[10] Pavlova's most famous role may be a "Dying" one of these animals, inspired by a namesake
Saint-Saens piece. In another ballet named for them, Siegfried saves Odette from Von Rothbart.
ANSWER: a swan [or The Dying Swan; or Swan Lake]
[10] Pavlova was involved with the Ballet Russes, which was founded by this man. He also commissioned Stravinsky's The Rite of Spring.
ANSWER: Sergei Pavlovich Diaghilev
17. This fort was named because it was hastily constructed following a skirmish at Jumonville Glen. For 10 points each:
[10] Name this fort surrendered by George Washington in July 1754.
ANSWER: Fort Necessity
[10] The Battle of Jumonville Glen is considered the first battle in this war; although it began two years earlier than the European conflict, it is generally considered the American theater of the Seven Years' War.
ANSWER: French and Indian War
[10] Following Washington's defeat, this British general led a 1755 expedition back to the area with the intention of taking Fort Duquesne, but died following the Battle of the Monongahela.
ANSWER: Edward Braddock
003-14-86-10217
18. They resided on Mount Parnassus. For 10 points each:
[10] Name these goddesses who served as inspiration to artists and poets in Greek mythology.
ANSWER: Muses [or Mousai; or Mousai]
[10] This Muse served as the inspiration for epic poetry, and was the mother of Orpheus.
ANSWER: Calliope
[10] In Greek myth, there were this many Muses; it is also the number of mothers Heimdall had in Norse myth.
ANSWER: nine
19. Performing this operation on the coordinates of a triangle can be used to find the triangle's area. For 10 points each:
[10] Identify this matrix operation, defined only for square matrices, which equals "a times d" minus "b times c " for a two-by-two matrix.
ANSWER: determinant
[10] This technique uses determinants to solve systems of equations by creating coefficient matrices. Despite its name, it was likely discovered first by Colin Maclaurin.
ANSWER: Cramer's rule
[10] This matrix operation can be used to calculate the dot product of column vectors A and B. It involves reflection over the diagonal and interchanging rows and columns accordingly.
ANSWER: transpose [or word forms]
20. This war was declared by Pope Urban II to cheers of "God wills it." For 10 points each:
[10] Name this conflict that concluded with the 1099 capture of Jerusalem, and was the first in a series of religious wars.
ANSWER: First Crusade
[10] In this disastrous early phase of the First Crusade, a badly equipped army led by Peter the Hermit was destroyed by the Seljuk army of Kilij Arslan.

## ANSWER: People's Crusade [or Peasants' Crusade]

[10] Conflicting transcripts exist of this Church council, at which Urban II called the First Crusade. ANSWER: Council of Clermont
21. This MAS politician is the Apu Mallku of the Aymara indigenous group to which he belongs. For 10 points each:
[10] Name this head of state whose plane was briefly rerouted to Vienna over concerns he was harboring an American fugitive in July 2013.
ANSWER: Juan Evo Morales Ayma [or Evo]
[10] That wanted fugitive was this American whistleblower who revealed the PRISM surveillance program used by the NSA.
ANSWER: Edward Joseph Snowden
[10] The NSA's PRISM, Canada's CSEC, and the UK GCHQ's Tempora surveillance programs all collect this type of data, which not data, but rather data about data.
ANSWER: descriptive metadata [or descriptive metacontent]

