1. **This type of method can be optimized by reusing the stack frame of the previous function call; that is known as tail optimization. Functions that commonly use this method include the divide-and-conquer solution to Towers of Hanoi and mergesort. A function that uses this procedure without a (*)** base case will run forever. Commonly used in binary tree traversals, for 10 points, name this method where a function references itself in its definition.
ANSWER: **recursion** [or **recursive** functions]

093-11-29-11102

2. **At this story's end, the narrator attempts to calm down his friend by reading a story about a knight named Ethelred who kills a dragon to obtain a large amount of gold called *The Mad Trist*. Earlier, one character in this work sings about "evil things, in robes of sorrow" which "assailed the monarch's high estate" in a poem titled "The Haunted Palace." The end of this work sees the death of (*)** Madeleine and the narrator's friend Roderick. For 10 points, name this Edgar Allan Poe short story which ends with the collapse of the title estate.
ANSWER: "The **Fall of the House of Usher**"

064-11-29-11103

3. **One of these objects could not be moved without the help of the giantess Hyrrokin. Another one of them made of fingernails will appear at Ragnarok; those objects are Hringhorni and Naglfar. The Sons of Ivaldi made another one of these objects for Freyr which could be folded and put in a pocket and float through the air called Skidbladnir. In Greek myth, one of these (*)** vessels was made out of sacred oak, transported Jason to retrieve the Golden Fleece, and was named the Argo. For 10 points, name this form of water transportation.
ANSWER: **ship**s [or **boat**s]

083-11-29-11104

4. **One solo by this man was immediately followed by the best-known solo of Jess Stacy and was played over a tom-tom accompaniment by Gene Krupa. In addition to Krupa, Teddy Wilson and Lionel Hampton were part of this man's namesake Quartet, one of the first integrated groups in jazz. This man's concert at Carnegie Hall culminated in the tune (*)** "Sing, Sing, Sing." For 10 points, name this "Patriarch of the Clarinet" and "King of Swing."
ANSWER: Benjamin David "Benny" **Goodman**

003-11-29-11105

5. **This man pirated Georges Méliès film *A Trip to the Moon* and sold it in hundreds of theatres. He demonstrated the use of alternating current on stray animals and advocated for its use in electric chairs as part of his smear campaign against it during the "War of the Currents" against George Westinghouse. He used the term (*)** "filament" to describe the innovative glowing strand that made the first commercially successful incandescent lamp possible. For 10 points, name this "Wizard of Menlo Park," inventor of the phonograph and a practical light bulb.
ANSWER: Thomas **Edison**

015-11-29-11106

6. **One holder of this name became the Red Hood after he returned from the dead. One character to operate under this name faked an engagement to Tamara Fox. Holders of this name have traditionally been leaders of the Teen Titans, but the current holder of this title has refused to join that group. The first man to hold this title later took the name (*)** Nightwing, and won the "Battle for the Cowl" after the disappearance of Bruce Wayne. For 10 points, name this sidekick of Batman, a role most famously filled by Dick Grayson.
ANSWER: **Robin** (accept **Red Robin** until "Teen Titans")

7. **This man appointed a Secretary of Energy to replace Georgina Kessel, in an effort to boost his country's economy. Before assuming his current office, he himself had served as Secretary of Energy under his predecessor before winning a highly contested election in 2006 against Roberto Madrazo (mah-DRAH-zoe) and Andrés Obrador (ahn-DRAYS OH-brah-DORE). This man has been heavily criticized for his failure to end the war between his country and (*)** several violent drug cartels. For 10 points, name this current President of Mexico.
ANSWER: Felipe de Jesús **Calderón** (cahl-day-ROAN) Hinojosa

8. **This nation contains the once nominally independent Bantustans of Transkei, Venda, Ciskei, and Bophuthatswana. This nation's currency is the Rand, and its largest city lies in Gauteng province. Cape Agulhas is the southernmost point in this nation. The (*)** Orange river defines part of its border with Namibia. Two of its capitals are Pretoria and Bloemfontein. For 10 points, name this country whose largest cities are Cape Town and Johannesburg, which hosted the 2010 World Cup.
ANSWER: **South Africa**

9. **This man wrote the definitive biography of the duke of Marlborough. He introduced labor exchanges and industry-specific minimum wages as president of the Board of Trade. That led to his promotion to First Lord of the Admiralty, where he orchestrated the disastrous Gallipoli campaign. During his "wilderness years," he denounced the Munich Pact, which lent him credibility when he promised to (*)** "fight them on the beaches." For 10 points, name this Prime Minister who succeeded Neville Chamberlain and led the U.K. for most of World War II.
ANSWER: Winston Leonard Spencer **Churchill**

10. **This philosopher's rule-following paradox was elaborated on by Saul Kripke, and it occurs in a work featuring the "beetle-in-a-box" thought experiment and a discussion of the private language argument and duckrabbits. He published only one book in his lifetime, a set of seven propositions the final of which reads (*)** "Whereof one cannot speak, thereof one must be silent". For 10 points, name this German philosopher influential in the development of logical positivism, who wrote *Philosophical Investigations* and *Tratatus Logico-Philosophicus*.
ANSWER: Ludwig **Wittgenstein**

11. **The compound AZT is typically used to inhibit one specific example of this group. Members of this group can replicate using either the lysogenic or lytic cycles. One member of this group named T4 is known for attacking *E. coli*. These entities have a protein coat called a capsid. Members of this group that attack bacteria are called (*)** bacteriophages (back-TEER-ee-oh-FAY-jezz). For 10 points, name this group of infectious agents, which includes the tobacco mosaic and influenza varieties.
ANSWER: **virus**es [or **HIV** before "example" is read; or human immunodeficiency **virus** before "example" is read; or **AIDS** before "example" is read; or **acquired immunodeficiency syndrome** before "example" is read]

12. **The original score of this work included several holes which were filled by improvisation at this work's premiere, and it was orchestrated three times by the composer of the *Grand Canyon Suite*, Ferde Grofe. This piece was written for a concert at Aeolian Hall entitled "An Experiment in Modern Music" by Paul Whiteman, and opens with a trill and (*)** 17-note glissando for solo clarinet. For 10 points, name this 1924 work for piano and orchestra which blended classical and jazz elements, by George Gershwin.
ANSWER: ***Rhapsody In Blue***

13. **This character discovers that John Openshaw was murdered by the Ku Klux Klan in "The Five Orange Pips." In another work, this man proves that Jack Stapleton has been conniving to obtain the title family's fortune. He often infuriates Inspector Lestrade and the other detectives of Scotland Yard. This protagonist of (*)** *The Hound of the Baskervilles* is the nemesis of Professor Moriarty. For 10 points, name this Arthur Conan Doyle creation, a detective who lives on Baker Street with his assistant, Watson.
ANSWER: Sherlock **Holmes** [or **Sherlock** Holmes]

14. **His political career began after he met Zakaria Mohieddine and Abd al-Hakim Amir in the Sudan. Eighteen years later, he sparked international controversy through a secret arrangement with Czechoslovakia for weapons. During that controversy, this leader reacted to John Foster Dulles's withdrawal of funding for a dam project by (*)** nationalizing and instituting tolls on the Suez Canal. For 10 points, name this predecessor of Anwar Sadat as the president of Egypt.
ANSWER: Gamal Abdel **Nasser**

15. **These numbers can be expressed using Binet's formula with a multiplier of one. Four of these numbers make up a Q-matrix. They were first described as the solution to a problem involving multiplying rabbits in the book *Liber Abaci*. Like Lucas numbers, these numbers share a recurrence relation, namely that the *n*th of these numbers is the (*)** sum of the previous two. For 10 points, name these numbers found in a sequence beginning 1, 1, 2, 3, 5.
ANSWER: **Fibonacci** numbers [or **Fibonacci** sequence]

16. **This man wrote a play in which a noblewoman, the lover of the poet Aleel, offers her soul to the devil in exchange for money to feed the poor. In addition to *The Countess Cathleen*, this man wrote a poem in which "the ceremony of innocence is drowned." In that poem by this man, "the falcon cannot hear the falconer," and it asks "what rough beast ... slouches towards Bethlehem to be born?" That poem is this man's (*)** "The Second Coming." For 10 points, name this Irish poet who wrote "Sailing to Byzantium."
ANSWER: William Butler **Yeats**

17. **Léon Gambetta attempted to organize one side's defenses in this war, but fled in a hot air balloon. The Treaty of Frankfurt ended this war, in which the Battle of Sedan was fought. One cause of this war was the possibility of Leopold of Hohenzollern gaining the Spanish throne. Another cause of this war was an edited letter between the ambassador of one country in this war and Wilhelm I. That (*)** Ems Dispatch was used to advance the goals of Otto von Bismarck. For 10 points, name this 1870-1871 war between two European nations that led to German unification.
ANSWER: **Franco-Prussian** War [or **Franco-German** War]

18. **A depiction of this scene by William-Adolphe Bouguereau (boo-ger-OH) shows two men blowing conch shells. A better known depiction of this scene features flowers floating through the air while a man produces wind from his mouth. That depiction also features a woman handing a (*)** pink cloak to the main figure, who stands nude on a conch shell. Sandro Botticelli painted a well known version of, for 10 points, what mythological scene which shows the conception of a certain Roman goddess?
ANSWER: *The **Birth of Venus*** [or ***Nascita di Venere***; or *La **Naissance de Vénus***]

19. **One person thought to have been involved in this event was Rudolph Schnaubelt. Louis Lingg committed suicide in the aftermath of this event. John Altgeld pardoned three people who were implicated in this event, including Samuel Fielden and Michael Schwab, but four men were hanged, including August Spies. This event occurred during a (*)** rally for striking workers when a bomb was thrown at the police by an unknown person. For 10 points, name this 1886 riot which took place in Chicago.
ANSWER: **Haymarket** Square Riot

20. **This man wrote about three imaginary dialogues between himself and St. Augustine in his *My Secret Book*. The brother of a Carthusian monk, he also wrote two books of biographies on Roman and Biblical leaders and an unfinished biography of Scipio Africanus. This author of *On Illustrious Men* and *Africa* is best known for (*)** *Il Canzoniere*, a collection of 366 poems dedicated to his lifelong love, who died from the plague in 1348. For 10 points, name this 14th-century Italian poet who wrote to a mysterious Laura.
ANSWER: **Petrarch** [or Francesco **Petrarca**]

21. **One novel by this author has a love interest who might be Joaquin Murieta. A sequel to that novel is narrated by Aurora and follows Clara, a clairvoyant mute who leaves notebooks her granddaughter Alba finds in another work. Her works *Daughter of Fortune* and *Portrait in Sepia* can be read as part of a trilogy following the del Valles. One of her works chronicles life at (*)** Tres Marias, the Trueba family hacienda, before and after a military coup. For 10 points, name this Chilean author of *The House of the Spirits*.
ANSWER: Isabel **Allende** Llona

22. **One figure in this war had his power cemented by his victory at Mortimer's Cross. This war began with the First Battle of St. Albans. One leader in this war was Richard Neville, known as the kingmaker. The origins of this war go back to the overthrow of Richard II. The Battle of(*)** Bosworth Field saw the death of Richard III and the rise of Henry Tudor at the end of this war. For 10 points, name this war between the House of Lancaster and the House of York named for the different colored flowers representing the houses.
ANSWER: **Wars of the Roses**

23. **In 1961, Claus Jönsson (CLOWS YUHN-sun) reproduced the set up of this experiment with electrons. The set up for this experiment when using only one particle gives the same results as the original, except when a detector is used. That detector being used causes a pair of (*)** bands to be formed instead of the usual pattern caused by interference. For 10 points, name this experiment first carried out by Thomas Young sending light through a pair of openings, which showed light has a wave nature.
ANSWER: Young's **double slit** experiment [or **Young's** experiment before it is read]

1. One rendition of this work was titled "The Wine of Nishapur." For the stated number of points:
[10] Name this work consisting of such quatrains as "The Moving Finger writes; and, having writ, Moves on: nor all thy Piety nor Wit/Shall lure it back to cancel half a Line, Nor all thy Tears wash out a Word of it."
ANSWER: _**Rubayyat**_ of Omar Khayyám [don't read the full title]
[10] The _Rubayyat_ was written by this Persian astronomer and polymath.
ANSWER: Omar **Khayyám**
[5/5] The most well-known poem from Omar Khayyám's _Rubayyat_ situates the speaker with "a Book of Verses underneath the Bough," these two items, and "Thou."
ANSWER: a jug of **wine** and a loaf of **bread** [we just want **wine** and **bread**, since the exact container varies from translation to translation]

020-11-29-11201

2. A function is bijective if it is both surjective and possesses this property. For 10 points each:
[10] Name this property which can be determined using the horizontal line test.
ANSWER: **one to one** or **injective**
[10] In a one to one function, every single member of this set maps to a unique member of the corresponding range. For the square root function, this set is equal to all numbers greater than or equal to zero.
ANSWER: **domain**
[10] If two functions are both one to one, applying this operation will result in a one to one function. Applying this operation to two functions f and g involves using the output of g as the input of f.
ANSWER: function **composition**

064-11-29-11202

3. Name these larger-than-life figures from American folklore, for 10 points each.
[10] This fictional lumberjack usually depicted accompanied by a blue ox.
ANSWER: Paul **Bunyan**
[10] Talcott, West Virginia is typically considered the place where this man's famous action occurred. This railroad worker defeated a steam-powered hammer in a race to make a tunnel, but died of exhaustion.
ANSWER: John **Henry**
[10] This legendary cowboy painted the Painted Desert, rode a horse that ate dynamite, and courted the lovely Slue-Foot Sue. He was raised by coyotes after falling out of a wagon near his namesake river.
ANSWER: **Pecos Bill**

002-11-29-11203

4. Answer these questions about the works of an American author, for 10 points each.
[10] In this short story, Peyton Farquhar imagines a daring escape when he is about to be hanged for interfering with the railroads.
ANSWER: "An **Occurrence at Owl Creek Bridge**"
[10] "An Occurrence at Owl Creek Bridge" was written by this author who also wrote the stories "Chickamauga" and "A Horseman in the Sky."
ANSWER: Ambrose Gwinnett **Bierce**
[10] Bierce also wrote this satirical dictionary, which defines a bore as "a person who talks when you wish him to listen."
ANSWER: *The **Devil's Dictionary***

5. For 10 points each, answer these questions about some interesting things people do with their food.
[10] Adding this brand of mints to Diet Coke causes a rather violent explosion of liquid due to the release of carbon dioxide.
ANSWER: **Mentos**
[10] Crushing the Wint-O-Green flavor of this candy in your mouth and observing the pieces in a darkened room will cause them to fluoresce.
ANSWER: **Life Savers**
[10] In a 2010 experiment, photographer Joann Bruso photographed a meal from this restaurant after leaving it on a counter for a year. The meal showed surprisingly little sign of decay.
ANSWER: **McDonald's**

6. This man wrote a short story about prisoners in the Spanish Civil War entitled "The Wall". For 10 points each:
[10] Name this French existentialist author of *Being and Nothingness* and *No Exit*.
ANSWER: Jean-Paul **Sartre**
[10] In this novel by Sartre, Antoine Roquentin is researching a biography of Marquis de Rollebon when he experiences the title feeling.
ANSWER: **Nausea**
[10] In Sartre's play *No Exit*, this character is a postal worker who is attracted to Estelle, but Estelle stabs her near the end of the play.
ANSWER: **Inez** **Serrano** [accept either]

7. In this musical, Bernardo sings, "Better get rid of your accent," after Anita claims, "I'll get the terrace apartment." For 10 points each:
[10] Name this musical which, in addition to "America," contains tunes such as "Tonight" and "Maria."
ANSWER: *West Side Story*
[10] *West Side Story* was composed by this man, who also composed *Chichester Psalms* and also served as conductor of the New York Philharmonic.
ANSWER: Leonard **Bernstein**
[10] Bernstein promoted the music of this onetime conductor of the New York Philharmonic who composed the *Titan* symphony and *Symphony of a Thousand*.
ANSWER: Gustav **Mahler**

8. This notation expresses an algorithm's upper bound of computational resources as a function of the size of the input. For 10 points each:
[10] Name this notation used in computer science.
ANSWER: **Big O** notation
[10] This problem can be solved in Big O of n factorial using brute force. It involves finding the shortest tour that visits each of a group of cities exactly once.
ANSWER: **traveling salesman** problem
[10] The nearest neighbor algorithm, which can approximate a solution to the traveling salesman problem, is an example of this type of algorithm, which always makes the locally optimal choice.
ANSWER: **greedy** algorithm

9. The speaker of this poem exclaims that "the afternoon, the evening, sleeps so peacefully!" and observes "the yellow fog that rubs its back upon the window-panes". For 10 points each:
[10] Name this poem in which the speaker has "heard the mermaids singing, each to each".
ANSWER: **"The Love Song of J. Alfred Prufrock"**
[10] "The Love Song of J. Alfred Prufrock" was written by this poet also known for *Four Quartets* and *The Waste Land*.
ANSWER: Thomas Stearns **Eliot**
[10] This other poem from T. S. Eliot's *Prufrock and Other Observations* is in four sections, one of which opens "The morning comes to consciousness / Of faint stale smells of beer."
ANSWER: **"Preludes"**

10. At one point, Jews in this country were scheduled to be killed as revenge for the fictitious Doctors' Plot. For 10 points each:
[10] Name this former country which also targeted groups such as the "kulaks" for liquidation.
ANSWER: **USSR** [or **Union of Soviet Socialist Republics**; or **Soviet Union**; or **CCCP**; or **Soyuz Sovetskikh**; do not accept or prompt on "Russia"]
[10] The USSR went to war with this country twice on the eve of World War II, in the Winter War and Continuation War.
ANSWER: Republic of **Finland** [or **Suomi**; or **Suomen** Tasavalta; or Republiken **Finland**]
[10] During the Winter War, Soviet forces breached the defensive line named for this longtime leader of the Finnish army, who became president after World War II.
ANSWER: Carl Gustav **Mannerheim**

11. This man is depicted shortly before his death in the work *Phaedo*. For 10 points each:
[10] Name this philosopher who names a method of learning which consists of asking questions in order to stimulate critical thinking.
ANSWER: **Socrates**
[10] Socrates is depicted in works like *Phaedo* and *Gorgias* which were written by this student who also wrote of the allegory of the cave in *The Republic*.
ANSWER: **Plato**
[10] In this other Platonic dialogue, Socrates refuses an offer by a friend to escape from jail, stating that injustice is not a valid response to an unjust action.
ANSWER: *The **Crito***

12. This man composed the opera *Vanessa*. For 10 points each:
[10] Name this composer of *Adagio for Strings*.
ANSWER: Samuel **Barber**
[10] This man wrote the libretto for *Vanessa*. His compositions include the music for the operas *Amelia Goes to the Ball* and *The Consul*.
ANSWER: Gian Carlo **Menotti**
[10] Menotti is perhaps best known for this originally televised opera. The title cripple is healed after he offers his crutch as a gift for the infant Jesus.
ANSWER: ***Amahl and the Night Visitors***

13. For 10 points each, answer these questions about Bernoulli's principle.
[10] The principle states that lowering this quantity will raise a fluid's speed. This quantity is often measured in units of torrs or pascals.
ANSWER: **pressure**
[10] Bernoulli's principle works best for liquids moving slower than this point. Moving faster than this point will produce a sonic boom.
ANSWER: **speed of sound** (accept equivalents)
[10] Bernoulli's principle is often generalized for a liquid in this kind of field, in which the work needed to move from point A to point B is independent of the path taken.
ANSWER: **conservative** field

14. One of its members, Frederic Church, painted *The Heart of the Andes*. For 10 points each:
[10] Name this Romantic school of American painting whose members often depicted the Catskills, Adirondacks, and other mountains near the valley of the namesake New York river.
ANSWER: **Hudson River** School
[10] This founder of the Hudson River School painted such series as *The Course of Empire* and *The Voyage of Life*.
ANSWER: Thomas **Cole**
[10] Thomas Cole was painted standing next to William Cullen Bryant in the Catskills in this painting by Asher Durand, a later member of the Hudson River School.
ANSWER: ***Kindred Spirits***

15. This man was imprisoned at Robben Island during his 27 year prison term. For 10 points each:
[10] Name this Nobel Peace Prize laureate who became the first black president of South Africa in 1994.
ANSWER: Nelson Rolihlahla **Mandela**
[10] Mandela was a leader of this party, which is currently led by Jacob Zuma.
ANSWER: **African National Conference** [or **ANC**]
[10] Mandela was imprisoned for leading this militant arm of the African National Conference.
ANSWER: **Spear of the Nation** [or **Umkhonto we Sizwe**; or **MK**]

16. This trademarked brand name is owned by BCP Imports, the same company that sells Livestrong products. For 10 points each:
[10] Name these pieces of shaped rubber which became popular in 2010 despite several news stories about adolescents causing permanent damage by covering their entire arms in them.
ANSWER: **Silly Bandz**
[10] In March 2011, this chain of sandwich shops announced a partnership with Silly Bandz. It was founded on the shore of its namesake state in 1956 and offers such menu items as the Big Kahuna Cheese Steak and the "sub in a tub."
ANSWER: **Jersey Mike's**
[10] Silly Bandz also introduced a line in the shape of these three people in February 2011. One of their previous ventures, a debit card with high fees, led to lawsuits in December 2010.
ANSWER: the **Kardashians** [or the **Kardashian** sisters; or Kim, Khloe, and Kourtney **Kardashian**]

17. For 10 points each, answer these questions about the Grant presidency.
[10] During his presidency, a bill was passed to help protect freed slaves from this group founded by Nathan Bedford Forrest in the aftermath of the Civil War.
ANSWER: **Ku Klux Klan** [or **KKK**]
[10] Grant defeated this man to win his second term. This abolitionist was the editor of the *New York Tribune*.
ANSWER: Horace **Greeley**
[10] This first Vice President under Grant was forced to resign following allegations of corruption during the Credit Mobilier Scandal.
ANSWER: Schuyler **Colfax**

18. The Battle of the Windmill occurs in this book, in which Boxer learns the first four letters of the alphabet and is sent to the knacker's. For 10 points each:
[10] Name this George Orwell "fairy-story" in which the rise of Joseph Stalin is allegorized through the pig Napoleon.
ANSWER: *Animal Farm*
[10] This rival of Napoleon is driven from the farm early on, and is used to represent Leon Trotsky.
ANSWER: **Snowball**
[10] The Orthodox Church is represented in *Animal Farm* by this raven, who tells the other animals stories about "Sugarcandy Mountain".
ANSWER: **Moses**

19. This enzyme is used in a namesake chain reaction technique. For 10 points each:
[10] Name this enzyme that copies DNA.
ANSWER: **DNA polymerase**
[10] DNA replication occurs during this phase of the cell cycle.
ANSWER: **S** phase [or **Synthesis** phase]
[10] Since Okazaki fragments are created in DNA replication, this enzyme is required to join together fragments via a phosphodiester bond.
ANSWER: DNA **ligase**

20. This country is home to the Great Dividing Range and the Great Sandy Desert. For 10 points each:
[10] Name this country made up of six states and two territories that has a capital at Canberra.
ANSWER: Commonwealth of **Australia**
[10] This part of the Great Dividing Range is the tallest peak on Australia and was named after a Polish hero from the American Revolutionary War.
ANSWER: Mount **Kosciuszko**
[10] This formation in the Northern Territory is over two hundred miles away from the nearest city, Alice Springs.
ANSWER: **Ayers Rock** [or **Uluru**]

21. France, under Napoleon III, allied with Sardinia to defeat the Austrians at this 1859 battle. For 10 points each:
[10] Name this battle, which took place days after Magenta and was a successful part of the attempt to free northern Italy from Austrian rule.
ANSWER: Battle of **Solferino**
[10] Swiss observer Henri Dunant was so appalled at the carnage of Solferino that he founded this organization, which helps wounded soldiers and provides disaster relief.
ANSWER: **Red Cross** [or the International Federation of **Red Cross** and Red Crescent Societies]
[10] Dunant also worked to ratify the first of these agreements, in 1864; it bound countries to treat sick or wounded opponents as neutrals.
ANSWER: **Geneva Convention**s