1. This number times \( i \) is the denominator of the Cauchy integral formula. This is the smallest positive \( x \) for which \( e^x \) equals 1. Over the square root of this number is used to standardize the standard (*) normal distribution. The “tau [rhymes with ‘how’] manifesto” supports using this number, rather than half of it, in teaching math. For 10 points—what number is the period of the sine [“sign”] and cosine [“co-sign”] functions? Answer: 2\pi (or 2 times \pi or \pi times 2; accept tau before “tau”)

2. This title entity distinguishes a man who is “coming to you on a dusty road” in a Sam & Dave song. The player awakens in the Northern Undead Asylum in a video game whose title refers to these things. “Double consciousness” is examined in a (*) W. E. B. Du Bois [doo-BOYSS] book named for these things “of Black Folk.” The poem “Invictus” declares “I am the captaining” —for 10 points—what incorporeal [in-kor-POR-ee-ul] entity contrasted with mind and body? Answer: souls (accept Soul Man or Dark Souls or The Souls of Black Folk; accept I am the captain of my soul) [The Northern Undead Asylum is the starting area of Dark Souls.]

3. During the revolution that brought this dynasty to power, Wasit was besieged after the losing side abandoned Kufa. The “Anarchy at Samarra” [suh-MAH-ruh] followed the assassination of this dynasty’s ruler al-Mutawakkil [al moo-tah-WAK-kill]. This dynasty stopped the westward expansion of the (*) Tang Dynasty at the Battle of Talas. Harun al-Rashid [hah-ROON ah-rah-SHEED] established the House of Wisdom in Baghdad during—for 10 points—what caliphate [KAY-ih-“fate”] that overthrew the Umayyads [oo-“MY”-yeedz]? Answer: Abbasid [ah-BASS-sid] Caliphate (accept Abbasid; accept al-Abbasiyyah or al-Abbasiyyun; accept Abbasid Empire; prompt on “Caliphate” before “caliphate”)

4. In this film, a woman who asks for something “light” to read is given a leaflet on “Jewish sports legends.” A child in this film realizes that Roger Murdock is actually the basketball player (*) Kareem Abdul-Jabbar [kuh-REEM ah-DOOL juh-BAR]. Leslie Nielsen [NEEL-sun] co-stars in this film as a doctor who remarks “don’t call me Shirley.” Otto the inflatable auto-pilot appears in—for 10 points—what 1980 disaster movie parody about a troubled flight? Answer: Airplane! [After being told “surely you aren’t serious,!” Nielsen’s character responds “I am serious. And don’t call me Shirley.”]

5. On the left side of this painting, a castle built by the Knights Templar sits on a hill above a structure that may represent Agali [ah-GAH-lee], a monastery once led by Saint Ildefonso [eel-day-FOHN-soh]. This painting exaggerates the height of a (*) cathedral spire. In its foreground, rolling green hills border a river that is spanned by the Alcántara [al-KAHN-tah-rah] bridge. A stormy sky appears above the title Spanish city in—for 10 points—what painting by El Greco [GREH-koh]?

Answer: View of Toledo (or Vista de Toledo)
6. This author wrote about people who are murdered after voting to divert water from a wealthy rancher in “Handcarved Coffins,” which appeared in his book Music for Chameleons. Floyd Wells snitches on a former roommate to the investigator Alvin (*) Dewey in a book by this man that ends with the execution of Dick Hickock and Perry Smith. For 10 points—what man detailed the murder of the Clutter family in his book In Cold Blood?

   answer: Truman (Garcia) Capote [kuh-POH-tee] (or Truman Streckfus Persons)

7. Herodotus [hair-AH-duh-tuss] claimed these people were called “Oiorpata” [oy-OR-pah-tah] by the Scythians [SITH-e-uhn], whose lands they settled after losing to the Greeks in battle. Hera [HAIR-uh] caused these people to believe that their ruler had been abducted by a visiting hero. Members of this group included (*) Melanippe [mel-AN-ip-ee], Antiope [an-TYE-uh-pee], and Penesthesia [pen-thuh-sih-LEE-uh]. During his ninth labor, Heracles won the girdle of Hippolyta [hih-PAH-lih-tah], a queen of—for 10 points—what tribe of warrior women?

   answer: Amazons (or Amazónes)

8. When this technique is used with Python’s “new-style” classes, the C3 linearization algorithm defines resolution. Java expanded partial support of this technique in version 8 by introducing “default” methods in interfaces. This technique can lead to a “diamond problem” in which a method has conflicting definitions in (*) two parents. For 10 points—name this type of inheritance in which a class has more than one superclass.

   answer: multiple inheritance (accept multiple inheritance of implementation; accept multiple by itself after “inheritance”; prompt on “inheritance” before “inheritance”; do not accept or prompt on “virtual inheritance” or “mix-in” or “object-oriented (programming)” or “having multiple superclasses” or other descriptive answers)

9. This ruler sent a clockwork organ to Sultan Murad III, although Murad died before the gift arrived. This ruler expelled Bernardino [bair-nair-DEE-noh] de Mendoza from court after the exposure of the Throckmorton Plot, which threatened this ruler. Sir (*) Francis Walsingham [WALL-sing-ham] coordinated spies under this ruler. In a speech to troops at Tilbury [TILL-bury], she claimed to have “the heart and stomach of a king.” For 10 points—name this Tudor queen of England.

   answer: Elizabeth I of England (prompt on “Elizabeth”)

10. This country is home to the mixed-race Rehoboth Basters [REE-oh-“boat” BASS-turz]. Its largest ethnic group, the Ovambo [oh-VAHM-boh], form a majority of its dominant SWAPO [SWAH-poh] political party. Until 1994 this country’s southern neighbor controlled its Penguin Islands and its deepwater port of (*) Walvis Bay, which is south of this country’s isolated Skeleton Coast. Windhoek [VINT-“hoak”] is the capital of—for 10 points—what country northwest of South Africa?

    answer: Namibia [nuh-MIB-ee-uh] (or Republic of Namibia)

11. This family’s patriarch says that the work of Cornelius Agrippa [uh-GRIP-uh] and Paracelsus [pair-uh-SEL-suss] is “sad trash.” Before dying of scarlet fever, this family’s matriarch entrusts the care of Ernest and William to an adopted daughter named Elizabeth. Another member of this family recounts his studies at (*) Ingolstadt [in-GOHT-uh-shtah] to the Arctic explorer Captain Walton. For 10 points—the scientist Victor has what title surname in a novel by Mary Shelley?

    answer: Frankensteins (family) (accept Frankensteins; accept Alphonse Frankensteins or Caroline Beaufort Frankensteins or Ernest Frankensteins or William Frankensteins or Victor Frankensteins; or, The Modern Prometheus; do not accept or prompt on “Lavenza”)

12. A version of this amino acid attached to an adenosine [uh-DEN-uh-seen] molecule serves as a common methyl donor cofactor. Chloroplasts, mitochondria [my-toe-CON-dree-uh], and bacteria use a formyl derivative of this compound. Cysteine [SISS-teen] and this compound are the only (*) amino acids to contain sulfur. This amino acid is encoded by AUG [“A-U-G"], the start codon [“CODE-on”]. For 10 points—name this amino acid used by ribosomes [RYE-buh-sohmz] to begin protein translation.

    answer: methionine [muh-”THIGH”-uh-neen] (accept Met or M)
13. A chancellor during this dynasty who instituted the “New Policies” was opposed by the conservative Sima Guang [see-muh gwahng]. Its second emperor signed the Treaty of Shangyuan [shaahn-yoo-uhn], which gave up the Sixteen Prefectures. Taizu [tie-zoo] founded this dynasty, which moved its capital to (*) Hangzhou [hahn-zoh] from Kaifeng [ke-e-uhn] after the Jurchens conquered its northern territories. For 10 points—name this dynasty that Kublai Khan overthrew to found the Yuan [yoo-ahn] dynasty.

answer: Sung [sohng] Dynasty (or Sung Dynasty or Song Chao; accept Northern Song Dynasty or Southern Song Dynasty)

14. This instrument plays the “Abbyss of Birds” movement in Olivier Messiaen’s [oh-lyv-yay-ahzn] Quartet for the End of Time. It has a solo part in the last movement of Leonard Bernstein’s [burn-styne] Prelude, Fugue and Riffs. Strings and harp join this instrument in an Aaron Copland [COPE-lund] concerto. Ross Gorman improvised an (*) effect on it while rehearsing a 1924 work by George Gershwin. For 10 points—what woodwind plays a glissando [glih-SAHN-doh] to open Rhapsody in Blue?

answer: clarinet(s) (accept B-flat clarinets or soprano clarinets)

15. A 2017 Latino Victory Fund ad supporting this politician portrayed a pickup truck trying to run down minority children. After this man spoke in favor of Kathy Tran’s repeal Act regarding third-term abortion, he was accused of wanting to “execute a baby after birth.” A photo from a (*) 1984 med school yearbook may show this man in blackface, next to a person in a KKK outfit. For 10 points—name this governor of Virginia.

answer: Ralph (Shearer) Northam

16. The interaction of a nucleophile [NOO-klee-oh-“ile”] with a center of this geometry is described by the Bürgi-Dunitz [BURG-ee DOO-nitz] angle. Nucleophiles attack centers with this geometry in addition-elimination reactions, such as hydrolysis [hih-DRAH-lee-sis] of an ester. Boron compounds often have this geometry, also seen in (*) sp² [“S-P two”] hybridized carbons such as ethylene [ETH-uh-leen]. For 10 points—name this geometry in which bond angles of 120 degrees separate three atoms.

answer: trigonal planar [TRIG-uh-nul PLAY-nur] molecular geometry (accept AX₃ prompt on partial answers; prompt on “triangular” or “triangle”)

17. A senator from this state attacked net neutrality in a 2006 speech that described the Internet as a “series of tubes.” In this state’s 2010 Republican Senate primary, Joe Miller defeated an incumbent who nevertheless went on to be re-elected as a write-in candidate. (*) Ted Stevens and Lisa Murkowski [mur-“COW-ski”] have both represented—for 10 points—what state formerly governed by 2008 vice presidential nominee Sarah Palin [PAY-lin]?

answer: Alaska

18. A character created by this author gets a job with the help of Shvonder after adopting the nonsensical name Poligraf Poligrafovich [POH-lih-grahf POH-lih-GRAHF-uh-vitch]. This author wrote a novel in which Berlioz is beheaded by a streetcar. This author of (*) Heart of a Dog wrote a book that interweaves the story of Pontius Pilate [PON-shuss “pilot”] with the story of Satan’s time in Soviet-era Moscow. For 10 points—name this author of The Master and Margarita.

answer: Mikhail (Afanasyevich) Bulgakov

19. A system has this property if it has only one non-zero coefficient in its Schmidt decomposition. Bell pairs have this property maximally. It explains a thought experiment in which the Heisenberg [HIGH-zin-bairg] uncertainty principle appears to be inconsistent with relativity, called the (*) EPR [E-P-R] paradox. Two particles can have properties linked by—for 10 points—what quantum phenomenon that Einstein called “spooky action at a distance”?

answer: quantum entanglement (accept entangled states)
20. **The subtitle of Richard Fenno’s 1978 book *Home Style* refers to 18 of these places analyzed using “soak and poke” empirical methodology.** The Supreme Court struck down examples of these places designed to promote racial discrimination in the 1960 case of *Gomillion v. Lightfoot*. The (*) census is used to create 435 roughly same-sized examples of—for 10 points—what places that can be unfairly “gerrymandered”? 

**answer:** congressional districts (or House districts; accept Home Style; House Members in Their Districts; accept answers indicating the home district of a U.S. congressperson; prompt on “constituency” or “constituencies”) 

21. **This man’s father was superintendent of the New Jersey state police during the investigation of the Lindbergh baby kidnapping.** This officer commanded ground forces during Operation Urgent Fury, the U.S. invasion of Grenada [greh-NAY-dah]. He deployed a “left hook” strategy to destroy the (*) Republican Guard and liberate Kuwait while leading coalition troops against Iraq. For 10 points—what Gulf War general was nicknamed “Stormin’ Norman”?

**answer:** Norman Schwarzkopf [SHWARTZ-kawf] (or Herbert Norman Schwarzkopf Jr.) 

22. **In August 2018 this leader dismissed Clare Curran from the cabinet for not disclosing a meeting with tech mogul Derek Handley.** This leader and Emmanuel Macron [mah-KROHN] hosted a May 2019 “call” with tech companies over extremist content online, two months after 51 people were killed in (*) mosque shootings in her country. In 2018 she gave birth to her daughter while in office. For 10 points—name this prime minister of New Zealand.

**answer:** Jacinda Ardern [juh-SIN-duh ar-DURN] (or Jacinda Kate Laurell Ardern) 

23. **The TASSO [TASS-oh] collaboration at PETRA [PEH-truh] found the first direct evidence for these particles by studying three-jet events. A yet-unconfirmed prediction of the Standard Model is that these particles assemble into “balls.” These massless vector gauge (*) bosons [BOH-zahnz] come in eight colors, and form hadrons [HAY-drahnz] along with quarks. The strong force is carried by—for 10 points—what particles that hold nuclei [NOO-klee-“eye’] together?**

**answer:** gluons [GLOO-ahn] 

24. **This author contrasted the novels *Remainder* and *Netherland* in “Two Directions for the Novel,” an essay included in her book *Changing My Mind.* Critic James Wood coined the term “hysterical realism” in an essay about a book by this author in which Millat joins the (*) Muslim fundamentalist group KEVIN [“kevin”]. For 10 points—name this British author who created the best friends Archie Jones and Samad Iqbal [ik-BAHL] in her 2000 novel *White Teeth.*

**answer:** Zadie Smith (or Sadie Smith)
### Bonuses

**1.** For 10 points each—answer the following about milk in British literature:

| A. | Alex and his droogs frequent the Korova [koh-ROH-vah] Milk Bar in this author’s novel *A Clockwork Orange.* | answer: Anthony Burgess [BUR-jess] (or John (Anthony) Burgess Wilson) |
| B. | Mr. Ramsay finds an earwig in a glass of milk in this novel, which takes place in the Hebrides [HEB-rih-deez]. | answer: *To the Lighthouse* [*To the Lighthouse* was written by Virginia Woolf.] |
| C. | Gabriel Syme is pursued by a milk-drinking professor in this author’s novel *The Man Who Was Thursday.* | answer: G. K. Chesterton (or Gilbert Chesterton) |

**2.** This group was founded after Guru Gobind Singh stirred water and sugar with a sword. For 10 points each—

| A. | Name this Sikh [seek] group founded in the face of Mughal persecution. They are distinguished from Sahajdhari [sah-hazhd-HAH-re] Sikhs by being initiated with Anrmit [AHM-riit]. | answer: Khalsa [Amrit is a ceremony of baptism.] |
| B. | Guru Gobind Singh also mandated that the members of Khalsa always wear this number of “K”s as signs of devotion. This is half the number of commandments given to Moses on Mount Sinai [SYE-nye]. | answer: 5 (accept Five K’s; do not accept or prompt on “Ten (Commandments”) |
| C. | One of the Five K’s is the Kangha [kung-GAH], one of these objects used for personal grooming and cleanliness. | answer: (wooden) combs (do not accept or prompt on “(hair)brushes”) |

**3.** For 10 points each—answer these questions about landmark epidemiology [EP-ih-DEE-mee-ah-LAH-nee] studies:

| A. | John Snow proved that a water pump on London’s Broad Street was the source of an 1854 epidemic of what disease that leads to diarrhea, and is caused by a germ in genus *Vibrio* [VIB-ree-oh]? | answer: cholera [KAH-luh-ruh] (accept Vibrio cholerae infection) |
| B. | What Hungarian found that hand-washing could reduce the rate of postpartum puerperal [‘pew’-UR-puh-ruhl] fever, a discovery that was derided until the advent of germ theory? | answer: Ignaz (Philipp) Semmelweis [IG-nahts ZEM-mul-‘vice’] |
| C. | A “risk score” for cardiovascular health is named after what city west of Boston? Residents of this city have participated in experiments since 1948. | answer: Framingham, Massachusetts (accept Framingham Risk Score or Framingham Heart Study) |

**4.** This book describes “regulating lines” as a “guarantee against wilfulness,” and outlines the “three reminders” of mass, surface, and plan. For 10 points each—

| A. | Name this 1923 book whose opening “argument” includes the statement “the house is a machine for living in.” | answer: *Towards a New Architecture* (or Vers une architecture; accept Toward a New Architecture or Toward(s) an Architecture) |
| B. | This Swiss-French architect wrote *Towards a New Architecture.* He commonly went by a pseudonym. | answer: Le Corbusier [luh kor-boo-zee-AY] (or Charles-Édouard Jeanneret Gris; do not accept or prompt on “Corbusier”) |
| C. | In both *Towards a New Architecture* and his “Five Points of Architecture,” Le Corbusier advocated using this part of a building as space for a garden. | answer: roof(s) (or rooftops; prompt on answers referring to the “top” or “exterior” of a building; do not accept or prompt on “ceiling(s)”)}
5. This man’s former prime minister, Morgan Tsvangirai (CHAHN-guh-rye), called for his resignation in November 2017. For 10 points each—
   A. Name this former dictator of Zimbabwe who was deposed in a 2017 coup d’état [koo day-TAH].
   answer: Robert (Gabriel) Mugabe (moo-GAH-bay)
   B. Mugabe and his wife Grace were subsequently expelled from this party that has ruled Zimbabwe since independence.
   answer: ZANU-PF (ZAH-noo-‘P-F’) (or Zimbabwe African National Union—Patriotic Front)
   C. This current president succeeded Mugabe after the coup, and allegedly defeated Nelson Chamisa in Zimbabwe’s disputed 2018 presidential election.
   answer: Emmerson (Dambudzo) Mnangagwa (man-an-GAG-wah)

6. At the end of this story, Mathilde (mat-TEELD) learns the title object was only worth 500 francs. For 10 points each—
   A. What Guy de Maupassant (‘ghee’ duh moh-pah-SAHNT) story is named for a piece of jewelry?
   answer: The Necklace (or The Diamond Necklace or La Parure)
   B. This author’s story “Paste” was inspired by “The Necklace.” He wrote about a sickly heiress in his novel The Wings of the Dove.
   answer: Henry James
   answer: Ada or Ardor (: A Family Chronicle) (do not accept or prompt on “Ardor”)

7. In the aftermath of this incident, Daniel Webster devised a legal standard for judging claims of self-defense. For 10 points each—
   A. Name this 1837 “affair” in which a ship was seized by British troops, set on fire, and sent over Niagara [nye-AG-ruh] Falls.
   answer: Caroline Affair
   B. The British claimed the Caroline was being used by rebels agitating for independence in what is now this country.
   answer: Canada
   C. The leader of the Caroline rebels had this surname, which he shared with a Scottish explorer who crossed Canada to reach the Pacific Ocean in 1793.
   answer: Mackenzie (accept Mackenzies; accept William Lyon Mackenzie or Alexander Mackenzie)

8. This was the first protein to have its structure determined by X-ray crystallography (‘crystal-AH-gruh-fee), for which John Kendrew and Max Perutz won a Nobel Prize. For 10 points each—
   A. Name this protein found in high levels in aquatic mammals. In humans, it is normally only released into the bloodstream following a muscle injury.
   answer: myoglobin (MY-oh-GLOBE-een)
   B. Like hemoglobin, the metal-binding region of myoglobin is comprised of this cyclic (“SICK-lick”) compound with four nitrogen atoms. Its name comes from the Greek for “purple.”
   answer: porphyrin (POR-fuh-run)
   C. In another similarity with hemoglobin, the porphyrin ring of myoglobin binds to an atom of this transition metal.
   answer: iron (or Fe)
9. This work’s composer noted that he had created many performances of it while walking alone in the woods. For 10 points each—
   A. Name this work premiered by pianist David Tudor at the Maverick Concert Hall in Woodstock, New York.
   answer: 4'33" ("four minutes thirty-three seconds")
   B. This American composed 4’33".
   answer: John Cage (or John Milton Cage Jr.)
   C. Cage’s early works—such as Sonatas and Interludes—called for screws, paper, and other objects to be inserted between a piano’s strings, a technique known as this type of "piano."
   answer: prepared piano (or preparing the piano; accept all forms of prepare or prepared or preparation(s))

10. This work describes Rome’s passage through three cycles of growth and decline. For 10 points each—
   A. Give the Latin title of this work divided into sections called “pentads,” which covers events from the founding of Rome to the death of Drusus in 9 BC.
   answer: Ab Urbe Condita [ahb UR-bay kohn-DEE-tuh] (or Historiarum Ab Urbe Condita (Libri) or Annales)
   B. This Roman Golden Age historian wrote Ab Urbe Condita.
   answer: Livy [LIH-vee] (or Titus Livius)
   C. Livy may have been exiled by this emperor, and wrote that this man would lead Rome into another cycle of growth. Livy may have been exiled by this emperor’s successor, Tiberius [tie-BER-ee-us].
   answer: Augustus Caesar or Octavian (or Gaius Octavius or Gaius Julius Caesar Octavianus; do not accept or prompt on "(Julius) Caesar")

11. The nickname “Magic City” has been given to several U.S. locations. For 10 points each—
   A. This capital of Wyoming was called the “Magic City of the Plains” due to its rapid growth.
   answer: Cheyenne [shy-EN]
   B. A former president of the Northern Pacific Railroad is the namesake of this “Magic City,” which is the most populous city in Montana.
   answer: Billings [The city is named after Frederick H. Billings.]
   C. This North Dakota city earned the nickname due to its “magic” growth along the Great Northern Railway. Its annual music and arts festival is named “Why Not” this city.
   answer: Minot [MY-not] (accept Why Not Minot)

12. For 10 points each—answer the following about Duke University’s recent early exits from the NCAA ["N-C-double A"] tournament:
   A. In 2012 Duke—which had this numerical seed in its region—lost in the first round to Lehigh [LEE-high], the region’s 15 seed.
   answer: 2 seed (or second seed)
   B. Commentators quipped that Duke had been “tripped up” by South Carolina in the second round of the 2017 tournament, referencing this shooting guard’s numerous tripping incidents.
   answer: Grayson (James) Allen
   C. In 2013 Duke lost in the first round to 14-seed Mercer, which in 2014 left the Atlantic Sun conference to join this mid-major. Its members include Furman, Samford, and East Tennessee State.
   answer: Southern Conference (prompt on “SoCon”)
13. This book’s author may have depicted himself in the story of a naked fugitive running from soldiers in a garden. For 10 points each—
A. Name this biblical book that religious scholars believe was the primary inspiration for two longer “synoptic” [“sin-optic”] texts.
answer: Gospel According to Mark (or Euangélion katâ Mârkon)
B. The two-source theory claims that the gospels of Matthew and Luke were inspired by Mark, and by this possibly mythical collection of the sayings of Jesus.
answer: Q source (or Q document or Q gospel)
C. The gospel of Mark offers the fullest description of Herod’s [HAIR-ud’2] beheading of this prophet, who predicted the coming of Jesus.
answer: Saint John the Baptist (or Ioannes ho Baptistes or Ioannes ho Baptizon; prompt on “(Saint) John” or “Ioannes”)

14. For 10 points each—answer the following about Nazi commando Otto Skorzeny [skor-ZEH-nee]:
A. Skorzeny launched Operation Knight’s Leap, an attempt to capture this leader who later co-founded the Non-Aligned Movement.
answer: Josip Broz Tito [TEE-toh] (accept either underlined portion)
B. Skorzeny led Operation Greif [gryef], in which Germans tried to impersonate American and British troops, as part of this offensive that aimed to seize bridges over the Meuse [mooz] River.
answer: Battle of the Bulge (or Battle of the Ardennes [ar-DEN] or the Ardennes Counteroffensive)
C. After World War II, Skorzeny fled to the protection of this fascist dictator of Spain.
answer: Francisco Franco (or Francisco (Paulino Hermenegildo Teódulo) Franco (y Bahamonde Salgado Pardo de Andrade))

15. An “Avenue” lined by over 20 of these trees is one of the most iconic tourist attractions of Madagascar. For 10 points each—
A. What type of African tree from genus Adansonia [ad-an-SOH-nee-uh] is recognizable by its extremely wide trunk?
answer: baobab(s) [BAUGH-bab] (or Grandidier’s baobab or Adansonia grandidieri; accept Avenue of the Baobabs)
B. The hollowed-out trunks of dead baobabs were once used as tombs for these storytellers, who passed on the oral and musical traditions of West Africa.
answer: griots [GREE-oh]
C. Among the Mande [MAHN-day] people, griots continue to retell the Epic of Sundiata [soon-dee-AH-tuh], which is the founding myth of this medieval West African empire.
answer: Mali [MAH-lee] Empire (or Manden Kurufaba or Niani; accept Malian Empire)

16. Pencil and paper ready. Angela is 36 years old, her son Brian is 9 years old, and they share a birthday. For 10 points each—
A. How old will Angela be when Brian is Angela’s current age?
answer: 63 years old [Angela is 36 - 9 = 27 years older than Brian, so when Brian is 36, Angela will be 36 + 27 = 63 years old.]
B. After how many years from now will the ratio of their ages be 2 to 1?
answer: 18 years [Angela will always be 27 years older than Brian, so the ratio will be 2:1 when Brian is 27 years old, which will occur in 27 - 9 = 18 years.]
C. If Brian has a child on his 24th birthday, how old will Angela be when the ratio of her age to her grandchild’s age is 4 to 1? You have 10 seconds.
answer: 68 years old [Angela will be 27 + 24 = 51 years old when her grandchild is born, so if x is her age, x/(x - 51) = 4/1, so x = 4x - 204, so -3x = -204, and x = 68.]
17. Jess Walter's book *Every Knee Shall Bow* chronicles this 1992 event. For 10 points each—
A. Name this eleven-day standoff in Idaho that ended with the arrest of white separatist Randy Weaver, and the deaths of Weaver’s wife and son.
answer: **Ruby Ridge** (accept answers identifying Ruby Ridge, such as Ruby Ridge standoff)
B. The FBI besieged Ruby Ridge after Weaver sold sawed-off shotguns to undercover members of this other law enforcement agency. Like the FBI, this agency was criticized for its conduct at the 1993 Waco [WAY-koh] siege.
answer: **ATF** (or Bureau of Alcohol, Tobacco, and Firearms; accept Bureau of Alcohol, Tobacco, Firearms and Explosives)
C. Anger over the Ruby Ridge and Waco sieges motivated this man to carry out the 1995 Oklahoma City bombing. He was executed in 2001.
answer: **Timothy (James) McVeigh** [mik-VAY]

18. In some stories, Feng Meng breaks into a hero’s house to steal this substance. For 10 points each—
A. Name this substance given to Hou Yi [hooh yee] on Kunlun Mountain by the Queen Mother of the West.
answer: **elixir of immortality** (or pill of immortality or drug of immortality; accept answers indicating a non-peach substance that can be consumed to make one immortal or live forever or have eternal life; accept dan or shendan or xiandan or jindan or busi zhi yao; do not accept or prompt on “peach(es) of immortality”)
B. After taking the elixir of immortality, Hou Yi’s wife Chang’e [chang-uh] becomes the goddess of this location, her new home.
answer: **(Earth’s) Moon** (or Luna)
C. This type of animal accompanies Chang’e on the moon. Carrying the foot of this animal is often said to bring good luck.
answer: **rabbits** (or hares)

19. The law of mass action allows this quantity’s expression to be written directly from a chemical reaction. For 10 points each—
A. Name this measure of the relative amounts of products and reactants present when the forward and reverse reaction rates are identical.
answer: **equilibrium constant** (prompt on “K” or “Keq”; do not accept or prompt on “equilibrium”)
B. This specialized name is given to the equilibrium constant for a reaction in which a solid dissociates, usually into aqueous [AY-kee-us] ions.
answer: **solubility product** (prompt on “Keq”)
C. Pure solids and liquids do not appear in equilibrium expressions, because this measure of the effective concentration of the substance is always exactly 1.
answer: **chemical activity** (or thermodynamic activity)

20. A March 2019 crash in Ethiopia was the second accident within six months to involve this company’s 737 Max airplane. For 10 points each—
A. What American aerospace company is the principal rival of Airbus?
answer: **Boeing** [BOH-ing]
B. The first 737 Max crash, in October 2018, involved a plane purchased by Lion Air, a low-cost carrier based in this country where the crash occurred.
answer: **Indonesia** (or Republic of Indonesia or Republik Indonesia)
C. This low-cost carrier based in Ireland placed an order for 135 Max planes in 2018. After the crashes, it declined to take “any immediate action.”
answer: **Ryanair** [ryan-air] (do not accept or prompt on “Ryan”)
21. In the film *Keanu* [kee-AH-noo], Keegan-Michael Key’s character describes this musician as “the real OG” [‘O-G’]. For 10 points each—
   A. Name this musician whose solo hits include “Faith” and “Fastlove.” He and Andrew Ridgeley formed the duo Wham!  
   answer: George Michael (or Georgios Kyriacos Panayiotou)  
   B. In a viral YouTube video, Sergio Flores [SAIR-jee-eh FLOH-rayz] adopted the persona of “Sexy Sax Man” to publicly perform the opening sax riff from this George Michael song.  
   answer: Careless Whisper  
   C. This musician performed Michael’s “Fastlove” at the 2017 Grammys, where she won Song of the Year for her single “Hello.”  
   answer: Adele (or Adele Laurie Blue Adkins)  

22. For 10 points each—name these places that make soap from olive oil:  
   A. In 1688 Louis XIV [loo-EE “the 14th”] standardized the recipe for an olive oil soap named for this city. The name of France’s national anthem refers to this Mediterranean port.  
   answer: Marseille [mar-SAY] (or Marseilles; prompt on “La Marseillaise”)  
   B. A type of olive and laurel oil soap is named for this city, which was the most populous in Syria before being devastated by the ongoing civil war.  
   answer: Aleppo [uh-LEP-oh] (or Halab)  
   C. Laurel oil is excluded from the olive oil soap named for this historical region of central Spain, the site of the 16th-century Revolt of the Comuneros [kahm-yoo-NAY-rohss].  
   answer: Castile [kass-TEEL] (or Castilla)  

23. This story’s protagonist calls his servant Aminadab [uh-MIH-nah-dab] a “human machine” and a “man of clay.” For 10 points each—
   A. Name this story about a scientist named Aylmer, who tries to remove the title feature from his wife’s face.  
   answer: The Birth-Mark  
   B. Aylmer’s wife has this name, which is also the first name of Mr. Darcy’s sister in *Pride and Prejudice*.  
   answer: Georgiana [‘george-ee-AH-nuh] (accept Georgianas; accept Georgiana Aylmer or Georgiana Darcy)  
   C. “The Birth-Mark” was written by this author, who described a town filled with devil-worshipers in his story “Young Goodman Brown.”  
   answer: Nathaniel Hawthorne (or Nathaniel Hathorne)  

24. It takes two values to specify the location of an object in the sky. For 10 points each—
   A. One value, the declination [dek-LIH-NAY-shun], measures an object’s angle north or south of the “celestial” feature named for this great circle on Earth.  
   answer: (celestial) equator  
   B. This is the second coordinate. It measures the distance eastward, in hours, from the Sun’s location at the vernal equinox to the great circle containing the object.  
   answer: right ascension (prompt on “RA”; do not accept or prompt on partial answers)  
   C. This is an arrangement of two or more objects in the sky with the same right ascension. If the objects also have matching declination, a syzygy [SIH-zuh-jee] results.  
   answer: conjunction(s) (in right ascension)