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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****State Championships 2015****Round 1****First Period, Fifteen Tossups** |

*Note to all quizmasters: In pronunciation guides for this tournament, the cluster “ey” represents the vowel sound in the first syllable of “neighbor” or the words “stay” or “pray.”*

1. The Amistad Dam floods arable land and produces hydroelectric power on this river, just after the Devils River joins with it. This river enters the sea at a town where Theodore Roosevelt discharged dozens of black troops in the Brownsville affair. The Nueces (noo-ACE-ace) River, north of this one, was the alternative to it during a border dispute in the 1840s which became open war. For 10 points, name this river separating Ciudad Juarez (see-oo-DAHD WAH-rez) in Mexico from El Paso in Texas.
ANSWER: **Rio Grande** River [or Rio **Bravo**]

2. This psychologist’s theory of “genetic epistemology” argued that equilibration is the highest level of development. That idea by him requires a balance between the accommodation and assimilation of “schemas” (SKEE-muz). His Three Mountains Experiment showed that children in the pre-operational stage express egocentrism. In his theory, that stage follows the sensorimotor stage, where he observed that infants are unable to understand object permanence. For 10 points, name this Swiss psychologist who modeled four stages of cognitive development.
ANSWER: Jean **Piaget**

3. Even though Roy Campanella never played in this city, “Roy Campanella Night” was held here in 1959, setting a then-record MLB attendance mark. The National League team in this city plays the so-called “Freeway Series.” This city is home to the third-oldest ballpark in Major League Baseball, after Fenway and Wrigley. Before the 1958 season, Walter O’Malley moved his baseball team from Brooklyn to here. Clayton Kershaw is a star pitcher for this city’s team. For 10 points, name this California city where the Dodgers play.
ANSWER: **Los Angeles**

4. In this country, Jose Paranhos (JOE-zay puh-RAHN-os) wrote the “Rio Branco Law,” which was followed by the similar “Golden Law.” Getulio Vargas (jeh-TOOL-yo VAR-gess) led this country during its Estado Novo (ess-TAH-doh NOH-voh). This country’s last emperor ruled for over fifty years and was named Pedro II. It joined Argentina and Uruguay to fight Paraguay in the War of the Triple Alliance. For 10 points, name this South American country, currently led by Dilma Rousseff (JILL-muh roo-SEFF), which was once the largest colony of Portugal.
ANSWER: **Brazil** [Federative Republic of **Brazil**; or Republica Federativa do **Brasil**]

5. In the Bible, a ruler of this empire requests that court records be read to him to help him fall asleep. Resources from this empire allow Nehemiah (NEH-hem-AI-uh) to build a wall. One of its ministers is hanged using his own gallows after scheming to kill Mordecai. An invasion by this empire is foretold by the writing on the wall at Belshazzar’s (BEL-shuh-zar’s) feast. Haman (HEY-mun) is executed by its emperor Ahasuerus (ah-hahsh-VAIR-ohs), who marries Esther. For 10 points, name this empire whose founder Cyrus the Great ended the Babylonian captivity.
ANSWER: **Persia**n Empire [or **Achaemenid** Empire]

6. A scaled-down version of this object used in Japanese primary education is called a “soraban” (soh-rah-bahn). This object is named for a Greek “board without a base,” which functioned with loose stones known as “calculi” (cahl-COO-lee). The modern form of this object incorporates additional parts from the Chinese “suanpan” (SWAN-pahn). This item usually uses a bamboo frame supporting metal wires, and can be manipulated by a skilled operator quicker than electronic calculators. For 10 points, name this counting device that uses moving beads.
ANSWER: **abacus** [or **abaci**; or **abacuses**]

7. This event, which took place at Sixth Street Station, was witnessed by then-Secretary of War Robert Todd Lincoln. This event proved fatal thanks to maltreatment by Dr. Willard Bliss, who refused to allow Alexander Graham Bell to properly use a prototype metal detector on the victim of this event. The perpetrator of this event announced “I am a Stalwart of the Stalwarts! Arthur is President now!” after performing it in 1881. For 10 points, identify this action which Charles Guiteau performed on a Republican President.
ANSWER: **assassination** of James Abram **Garfield** [or equivalents for “assassination” such as **murder** or **shooting**]

8. An artist from this country painted a triptych called the *States of Mind* trilogy, and was part of a movement from this country whose manifesto declared a “roaring motor car... more beautiful than the Victory of Samothrace.” Another painter from this country depicted a shadowy scene of a girl rolling a hoop in *Mystery and Melancholy of a Street.* For 10 points, Futurist Umberto Boccioni (BOTCH-ee-oh-nee) and Giorgio di Chirico (CHEER-ee-koh) both hail from what Mediterranean country which was the cradle of the Renaissance?
ANSWER: **Italy** [or **Italia**; or Kingdom of **Italy**]

9. In the mythology of this country, a god fleeing the underworld tosses aside a hairpiece, which turns into a bunch of grapes. In this country, mischievous monsters that carry plates of water on their heads are called “kappas.” A goddess of this country is lured out of a cave by the dancing of Uzume (oo-ZOO-may). This country venerates the creator Izanagi (ee-zah-NAH-gee), whose sons include the storm god Susanoo (soo-suh-NOH-woh). For 10 points, name this country whose emperors are descended from the sun goddess Amaterasu (ah-mah-tah-RAH-soo).
ANSWER: **Japan** [or **Nihon**-koku; or **Nippon**-koku]

10. In this novel, the story of Gervayse (gair-VASE) hiring a carpenter is told by a man who tends chickens with the protagonist. Its preface declares that “the wrong-doing of one generation lives into the successive ones.” In this novel, the Colonel orchestrates the execution of Matthew Maule for witchcraft. Its protagonist falls in love with the hypnotist Holgrave. At the start of this novel, Hepzibah (HEP-zib-uh) and Clifford are visited by their cousin Phoebe. For 10 points, name this novel about the Pyncheon family by Nathaniel Hawthorne.
ANSWER: *The* ***House of the Seven Gables***

11. This process can occur due to negative epistasis (eh-pih-STAY-sis). The dumbbell and peripheral isolate models are subtypes of this process, which may result from prezygotic (pree-zai-GOT-ik) isolating mechanisms and assortative mating. Extreme cases of genetic drift can cause the “peripatric” (per-uh-PAT-rik) type of this process. It can occur in an allopatric version in which a geographic barrier prevents breeding between populations. For 10 points, name this phenomenon that results in a new taxonomic group distinct from other organisms in a genus.
ANSWER: **speciation** [or allopatric **speciation**; prompt on descriptive answers such as **making a new species**; prompt on **evolution**; prompt on natural **selection**]

12. This island’s rulers included a falconry enthusiast who issued the Constitutions of Melfi. The Hohenstaufen (hoh-hen-SHTAH-fen) emperor Frederick II had his power base on this island, where a 1282 rebellion against Angevin (OHN-juh-vin) rule broke out during a prayer service called Vespers. An honor code which involved not reporting crime to authorities, called “omerta” (oh-MAIR-tuh), emerged on this island. For 10 points, name this Mediterranean island which traded grain across the Straits of Messina separating it from mainland Italy.
ANSWER: **Sicily** [or **Sicilia**]

13. A remainder theorem for these things states that division by a linear factor gives a remainder equal to this thing evaluated at the constant in the linear factor. Every non-constant one of these things has at least one complex root because the complex numbers are algebraically closed according to the fundamental theorem of algebra; those roots can be found by factoring. For 10 points, name these expressions or equations that consists of variables and coefficients with only addition, multiplication, and integer exponents.
ANSWER: **polynomial**s [or **polynomial function**s; prompt on **function**s]

14. A sonnet by this poet declares, “Dull would he be of soul who could pass by a sight so touching in its majesty,” and exclaims, “Dear God! the very houses seem asleep!” This poet of “Composed upon Westminster Bridge” addressed his sister Dorothy in a long blank verse poem declaring “Nature never did betray the heart that loved her.” He wrote that poem after five years away from the title building on the river Wye. For 10 points, name this Romantic poet of “Tintern Abbey” who co-wrote *Lyrical Ballads* with Samuel Taylor Coleridge.
ANSWER: William **Wordsworth**

15. Strain gauges work by measuring the change in this quantity after a deformation. The product of this variable and capacitance has units of time. This quantity is zero inside an ideal battery. This quantity is theoretically infinite in one direction on a diode. It abruptly drops off to zero when metals expel their magnetic fields. This quantity is proportional to length and inversely proportional to cross-sectional area for a wire. The ratio between voltage drop and the current is this value. For 10 points, name this quantity that is measured in ohms.
ANSWER: electrical **resistance**

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****State Championships 2015****Round 1****Directed Round** |

1A. Which of the six basic trigonometric functions equals the reciprocal of the sine function, or hypotenuse over opposite side?
ANSWER: **cosecant** [do not accept or prompt on “secant”]

1B. What man, who was defeated in the Senate for confirmation to the Supreme Court in 1987, now lends his name to the political process of vigorously opposing a judicial nominee?
ANSWER: Robert **Bork** [Robert Heron **Bork**]

2A. Name the quantity that is the ratio between the output force and input force exerted on a simple machine.
ANSWER: **mechanical advantage** [or **MA**]

2B. What specific literary device is the usage of a part of something to represent its whole, exemplified by the word “crown” standing in for “king”?
ANSWER: **synecdoche** (sin-EK-duh-kee) [do not accept or prompt on “metonymy”]

3A. This is a 20-second calculation question. What is the greatest common factor of the polynomials x squared plus 3 xy minus 18 y squared and x squared minus 10 xy plus 21 y squared?
ANSWER: **x minus 3 y**

3B. This is a 20-second calculation question. I am drawing cards without replacement from a standard deck with no jokers. Given that the top card is ten of hearts, what is the probability that the next card is either another ten or another heart?
ANSWER: **5/17** [or **15/51**]

4A. What Langston Hughes poem opens by asking, “What happens to a dream deferred?”
ANSWER: “**Harlem**”

4B. What Dutch-speaking region of Belgium surrounds the bilingual Brussels Capital Region and is found north of Wallonia (wuh-LOH-nee-uh)?
ANSWER: **Flanders** [or **Vlaanderen**]

5A. Name the only English king from the House of Blois (BLOO-wah), who fought with his cousin Matilda during a period known as “The Anarchy.”
ANSWER: **Stephen** of Blois

5B. What English-language profession is held by a Spanish “bombero” (bom-BARE-oh), a French “pompier” (pom-pee-AIR), and an Italian “pompiere” (pom-pee-AIR-ay)?
ANSWER: **firefighter**s [or **fireman** or other equivalents]

6A. John Coltrane’s wife Naima (nai-EE-muh) lends her name to a track on what jazz album, named for the rapid chord progressions between B major, G major, and E-flat major used on its title piece?
ANSWER: ***Giant Steps***

6B. What pre-Socratic philosopher theorized that the forces of Love and Strife distinguished the four elements, and reportedly killed himself by jumping into Mount Etna?
ANSWER: **Empedocles** (emp-ED-oh-cleez)

7A. What ruler of the Mali Empire in the 1300’s reportedly brought hundreds of pounds of gold on his pilgrimage to Mecca?
ANSWER: Mansa **Musa** I

7B. What Victorian poet, known for his dramatic monologues, wrote about a man strangling his beloved with her own hair in “Porphyria’s (por-FEER-ee-uh’s) Lover”?
ANSWER: Robert **Browning**

8A. This is a 30-second calculation question. Triangle ABC has vertices at (3, 4), (6, 4), and (6, 8), in some order. Triangle DEF has vertices at (-3, -2), (-3, 10), and (x, y), in some order. How many (x, y) coordinate pairs exist such that ABC and DEF are similar, and x and y are both integers?
ANSWER: **8** [the points are at (6,10), (13,10), (6,-2), (13,-2), (-12,10), (-19,10), (-12,-2), and (-19, -2)]

8B. This is a 30-second calculation question. Suppose that a is a real constant. For what values of x will the graphs of y equals secant of a x and y equals x squared never intersect for any value of a?
ANSWER: x **between -1 and 1**

9A. What painful inflammatory disease is characterized by uric acid crystals depositing in joints and most frequently affects the big toe?
ANSWER: **gout** [or **podagra**]

9B. Saleem Sinai is the protagonist of what Salman Rushdie novel, whose title characters were all born within an hour of India’s independence?
ANSWER: ***Midnight’s Children***

10A. Wha “Coalition of the Radical Left” led by Alexis Tsipras (SEE-prus) formed a new Greek government following a January 2015 snap election?
ANSWER: **SYRIZA**

10B. What Palestinian assassinated Senator Robert F. Kennedy in 1968?
ANSWER: Sirhan B. **Sirhan** [Sirhan Bishara **Sirhan**]

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****State Championships 2015****Round 1****Third Period, Fifteen Tossups** |

1. This composer’s fourth symphony quotes the folk song “In the Field Stood a Birch Tree” and opens with a brass fanfare representing the “inexorable power of fate.” His final symphony has a second-movement waltz in 5/4 time and ends with an *Adagio lamentoso* (ah-DAH-jee-oh lah-men-TOH-soh) in the home key of B minor. In a piece by this composer, the anthem “La Marseillaise” (mar-see-YAYZ) is drowned out by “God Save the Tsar.” For 10 points, name this composer of the *Pathetique Symphony* who used cannon fire in his *1812 Overture*.
ANSWER: Pyotr Ilyich **Tchaikovsky**

2. In this poem, the speaker’s experiences in “the rainy Hyades” (HAI-uh-deez) and “the ringing plains” of a great city lead him to conclude, “I am a part of all that I have met.” This poem’s speaker is ashamed of living useless “among these barren crags” and urges his companions, “‘Tis not too late to seek a newer world.” The title figure of this poem is “strong at will” and vows during his dying years “to strive, to seek, to find, and not to yield.” For 10 points, name this dramatic monologue about a mythological king, written by Alfred, Lord Tennyson.
ANSWER: “**Ulysses**”

3. A king of this name attempted to prevent a war with notes addressed to “Willy.” The slogan “Orthodoxy, Autocracy, and Nationality” was used by a king of this name, who was opposed at the beginning of his reign by crowds chanting “Constantine and Constitution.” A king of this name created the Duma via the October Manifesto after Bloody Sunday. This name was shared by a tsar who faced the Decembrist uprising and one who was influenced by the mystic Rasputin. For 10 points, give this name of the tsar killed after the Russian Revolution of 1917.
ANSWER: **Nicholas** [or **Nicholas I**; or **Nicholas II**; or **Nikolai**]

4. A group of this number of people includes the knife-throwing Britt as well as the boy Chico, who stays behind with Petra, in a 1960 film by John Sturges starring Yul Brynner. Another group of this size loses over half its members while attempting to seize three muskets from marauders; that group of this number tries to save a peasant village even after finding out that it withholds its rice supply from them, and is led by Kambei (kom-BAY) and Kikuchiyo (kee-koo-CHEE-yoh). For 10 points, an Akira Kurosawa film is titled for how many samurai?
ANSWER: **seven** [or *The Magnificent* ***Seven***; or *The* ***Seven*** *Samurai*]

5. This hero is shown an omen in which his son’s head catches fire, after which a shooting star streaks through the sky. This hero exits the underworld through an ivory gate of “false dreams.” One of his lovers commits suicide by stabbing herself atop a funeral pyre. This hero uses a golden bough to visit the underworld and talk to his father Anchises (an-KAI-seez). After the fall of Troy, this hero travels to modern-day Rome, but is sidetracked by a love affair with the Carthaginian queen Dido. For 10 points, name this title hero of an epic poem by Virgil.
ANSWER: **Aeneas**

6. After hydrogen, the second most popular form of nuclear magnetic resonance spectroscopy (spek-TRAH-scup-ee) uses this element. Chlorine, fluorine, and this element make up a banned compound that breaks up ozone in the atmosphere through free radicals. The atomic mass unit is defined as exactly one-twelfth of its mass. A one-atom thick sheet of atoms of it is called graphene, which is stacked in graphite. For 10 points, name this element whose isotope 14 can be used to calculate the age of organic materials in a namesake type of “dating.”
ANSWER: **carbon** [or **C**]

7. The losers of this battle used the “hedgehog” strategy that previously prevailed at Na San. Two days after this battle began, the artillery commander Charles Piroth committed suicide with a hand grenade. During this battle, members of the Tai ethnic group abandoned a hill outpost nicknamed “Ann-Marie.” Breakout attempts after this battle ended resulted in about seventy troops escaping the victorious forces of Vo Nguyen Giap (VOH nuh-WIN JAHP). For 10 points, name this 1954 battle that ended French rule of Vietnam.
ANSWER: Battle of **Dien Bien Phu**

8. A character in this film frustrates his colleagues when he fails to interpret the statement “We’re going to lunch” as an invitation to go to lunch. Two of its characters are recruited to a team after being given six minutes to take a test that took the main character eight. While working at Bletchley Park, its protagonist builds a machine he dubs “Christopher” that breaks the German Enigma code used during World War II. For 10 points, name this 2014 biopic, starring Benedict Cumberbatch, which depicts the life and work of Alan Turing.
ANSWER: *The* ***Imitation Game***

9. This planet is home to the Northern Electrostatic Disturbance and a periodic phosphine-rich storm system called the Great White Oval. This planet shows a pattern of clouds around its north pole that forms a nearly perfect hexagon. This planet is studied by the Huygens (HIGH-hunz) craft, which was dropped into its atmosphere by the largest space probe ever built, Cassini. The same mission also discovered ice plumes on its moon Enceladus (en-SELL-uh-duss). For 10 points, name this planet that is orbited by Titan and surrounded by an extensive system of rings.
ANSWER: **Saturn**

10. This novel ends with a man replying, “Forever,” to a question asked on a riverboat. A character in this novel works for his Uncle Leo, and another marries a man who plays chess with Jeremiah de Saint-Amour. A woman in this novel marries the wealthy doctor Juvenal Urbino (hoo-vuh-NAL oor-BEE-noh). It traces the amorous involvements of Fermina Daza (fair-MEE-nah DAHT-zuh) and Florentino Ariza (floor-en-TEE-no ah-REET-zuh). For 10 points, name this novel by Gabriel Garcia Marquez partly set during an outbreak of the title disease.
ANSWER: ***Love in the Time of Cholera*** [or *El* ***amor en los tiempos de colera***]

11. This city was the site of the Castle Hill Rebellion, which included a march on this city’s suburb of Parramatta (PAH-ruh-MAH-tuh). The Hawkesbury River drains into Broken Bay just north of this city. This city’s namesake “Harbour Bridge” lies across Port Jackson, which is the starting point of a yacht race to Hobart that begins outside this city. Attractions in this city include Botany Bay and Jorn Utzon’s (YORN OOT-zon’s) concrete “shelled” opera house. For 10 points, name this capital of New South Wales, the most populous city in Australia.
ANSWER: **Sydney**

12. This man said that he was “the class president and athlete,” as compared to onetime classmate David Wildstein. This politician’s aide, Bridget Anne Kelly, sent Wildstein a message apparently plotting political payback against Mayor Mark Sokolich (SAH-koh-litch). He was mocked in January 2015 for his awkward hugging of Jerry Jones to celebrate victories by the Dallas Cowboys. This governor was investigated for his role in the closure of toll bridge lanes in Fort Lee. For 10 points, name this current Republican Governor of New Jersey.
ANSWER: Chris **Christie** [Christopher **Christie**]

13. In some organisms, this process occurs after a tube enters the micropyle (MIKE-ro-pie-ul) and pierces a synergid (SIN-ur-jid). In mammals, this process requires capacitated cells to release acrosomal (AK-ruh-soh-mul) enzymes that digest the zona pellucida (peh-LOO-sid-uh). In plants, gametophytes (gah-MEET-uh-fites) travel from the stigma to the ovule (AHV-yool) to perform this process, which occurs after pollination and produces a zygote (ZAI-goat). For 10 points, name this sexual process in which a sperm and egg unite.
ANSWER: **fertilization** [or **conception** unil it is read; or word forms such as **fertilizing**; prompt on sexual **reproduction**]

14. This poet described how space “began to toll, as all the heavens were a bell, and being, but an ear,” in a poem about how “a plank in reason broke.” Another of her poems facetiously laments, “How public, like a frog, to tell one’s name, the livelong June, to an admiring bog!” In another of her poems, she recalled when she “first surmised the horses’ heads were toward eternity” after climbing into a carriage. For 10 points, name this reclusive American poet who wrote “I’m nobody! Who are you?” and “Because I could not stop for Death.”
ANSWER: Emily **Dickinson**

15. This man founded the oldest continuously operating U.S. bank, the Bank of New York, and played a driving role in re-opening his alma mater, Columbia University. This man commanded the battalions that captured Redoubt 10 during the Battle of Yorktown. With James Madison and John Jay, this politician used the pseudonym “Publius” to publish the Federalist Papers. In George Washington’s cabinet, this Treasury Secretary was the rival of Thomas Jefferson. For 10 points, name this Founding Father who was killed in a duel with Aaron Burr.
ANSWER: Alexander **Hamilton**

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****State Championships 2015****Round 1****Tiebreaker/replacement questions** |

1. Ludwig Prandtl devised the thin boundary layer hypothesis to explain the absence of this force in liquids undergoing potential flow, which is called D’Alembert’s (DAL-uhm-bair’s) paradox. For spherical objects, this force is proportional to the radius times six pi according to Stokes’s Law. In airplanes, this force opposes the lift force. An equation formulated by Rayleigh, used to calculate this quantity, sets this force proportional to density, velocity squared and cross-sectional area. For 10 points, identify this force that counteracts motion through a fluid.
ANSWER: **drag** [or **air resistance**; or **fluid resistance**; prompt on fluid **friction**]

2. This deity accompanies Ottar (AH-tar) when he goes to ask the seeress Hyndla about his ancestry. This deity owns a cloak of feathers that enables the user to transform into a falcon. This deity is offered as a reward for a giant that builds a wall around Asgard. Thor disguises himself as this deity to retrieve Mjolnir (MYOL-neer) from a thieving giant. This deity obtained the necklace Brisingamen (BRIS-en-gah-men) by sleeping with four dwarves. For 10 points, name this Norse goddess whose similarly-named twin brother is Frey (FRAY).
ANSWER: **Freya** [or **Freyja**; do not accept “Frey,” “Freyr,” “Frigg,” or “Frigga”]

3. A poem by this author states that “the river is a strong brown God” and includes a headnote explaining how to pronounce its title, “The Dry Salvages” (sal-VAY-jes). This poet quoted Edmund Spenser by asking the Thames (TEMZ) to “run softly till I end my song.” He compared the evening to a “patient etherized upon a table” in a poem whose speaker wonders “Do I dare to eat a peach?” Another of his poems opens, “April is the cruelest month.” For 10 points, name this poet of *Four Quartets,* “The Love Song of J. Alfred Prufrock,” and *The Waste Land.*
ANSWER: T. S. **Eliot** [Thomas Stearns **Eliot**]

4. This city’s government was chosen by randomly drawing names from eight leather bags called “borse” (BOR-say), which placed nine men on the Signoria (SIN-yor-EE-uh). This city’s ruling family was targeted for assassination in the Pazzi (POT-see) Conspiracy. After the Bonfire of the Vanities, Girolamo Savonarola (jeh-RAH-luh-mo sah-vah-nah-ROH-luh) was hanged here. This city was home to Cosimo (CAH-suh-moh) and Lorenzo the Magnificent. For 10 points, name this Tuscan city that was ruled by the Medici (MEH-dee-chee).
ANSWER: **Florence** [or **Firenze**]

5. This city’s artificial islands of Vista, Viva and Terra are collectively called the “Floating Islands.” The Lotte World Tower in this city will reach 123 floors upon its completion. The Moonlight Rainbow Fountain sprays water from this city’s Banpo Bridge, which crosses the Han River. Chun Doo-hwan (doo-WON) was ousted shortly before the 1988 Summer Olympics were held in this city. This city is home to the headquarters of Samsung and Hyundai, as well as the wealthy Gangnam (GONG-num) district. For 10 points, name this capital of South Korea.
ANSWER: **Seoul**

What character lures Fortunato into the catacombs and walls him up in Edgar Allan Poe’s “The Cask of Amontillado” (ah-mahn-tee-YAH-doh)?
ANSWER: **Montresor**

This is a calculation question. When x over quantity x plus 2 is divided by quantity x plus 2 over quantity x plus 4, the result can be written as 1 plus a over quantity x squared plus b x plus c. What are a, b, and c?
ANSWER: **a = -4, b = 4, c = 4** [prompt on answers that only have the numbers **-4, 4, and 4** in some order]