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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl**  **State Championships 2015**  **Round 2**  **First Period, Fifteen Tossups** |

1. This term is derived from a committee established by Gregory XV (the fifteenth) in 1622 and titles a book by Edward Bernays. It is the subject of Sheryl Ross’s “epistemic (EHP-eh-STEM-ik) merit” model, and it gives its name to a description of mass media put forward by Edward Herman and Noam Chomsky. Notable examples of this phenomenon include the “big character posters” of Maoist China and the broadcasts of Joseph Goebbels (GUR-bulz) in Nazi Germany. For 10 points, give this term for biased communication designed to influence public opinion.  
ANSWER: **propaganda**

2. This war included a series of inconclusive battles such as “Old Baldy” and “Pork Chop Hill.” After returning from this war, a commander gave a speech saying that “old soldiers never die, they just fade away.” A risky amphibious assault that helped U.N. forces in this war occurred at the Battle of Inchon. Because he wanted to escalate this war, Douglas MacArthur was removed from command. After this war finished, the 38th north parallel was roughly used to map out the DMZ. For 10 points, name this conflict fought between 1950 and 1953 on an Asian peninsula.  
ANSWER: **Korean** War

3. A leader of this country used the phrase “its place in the sun” to describe its imperial ambitions. This country pushed the Namaqua (nah-MAH-kwuh) people into the desert as part of the Herero (heh-RAIR-oh) genocide in southwest Africa. This country, which had to give up Tanganyika and what’s now Namibia after World War I, called an 1885 conference in its capital to divide up Africa among the European powers. For 10 points, name this empire which developed colonial ambitions under Otto von Bismarck.  
ANSWER: **Germany** [or **German** Empire; or **Deutschland**]

4. If the variance of an instance of this distribution is unknown, it can be estimated from the conjugate prior inverse gamma distribution. The reciprocal of the standard deviation times the square root of two pi normalizes this distribution. The mean of a large number of independently generated random variables will approximately follow this distribution, according to the central limit theorem. Approximately sixty-eight percent of it lies within one standard deviation of the mean. For 10 points, name this statistical distribution that looks like a bell curve.  
ANSWER: **normal** distribution [or **Gaussian** distribution; or **bell curve** until it is read]

5. Part of this colony was briefly ruled by the Coddington Commission. The Great Swamp Fight of King Philip’s War took place in this colony, and the British customs ship *Gaspee* (gas-PAY) was torched near Warwick here. It declared an Act of Renunciation against George III on May 4, 1776. This colony’s town of Portsmouth, on Aquidneck (uh-KWID-neck) Island, was settled by dissident Anne Hutchinson. For 10 points, name this thirteenth colony to ratify the U.S. Constitution, which was founded as a haven for religious tolerance by Roger Williams.  
ANSWER: **Rhode Island** [State of **Rhode Island** and Providence Plantations]

6. In a scene from this novel, a grotesque head says, “You knew, didn’t you? I’m part of you,” to a boy experiencing apparitions and fainting fits. In this novel, small children are collectively referred to as “littluns.” In this novel, a pig’s head impaled on a stick “speaks” to Simon in the guise of the title character. This novel’s characters create a fire using the glasses of the chubby boy Piggy. For 10 points, name this novel in which Ralph and Jack take control of a set of boys marooned on a deserted island, written by William Golding.  
ANSWER: ***Lord of the Flies***

7. At the request of his wife, this hero chases after a beautiful golden deer that turns out to be a demon in disguise. He angrily shoots arrows into the ocean until the sea god Varuna (vah-ROO-nuh) emerges. This hero’s sandals are placed in front his throne throughout his fourteen years of exile, during which time he befriends the monkey god Hanuman (HAH-noo-mun), slays the demon Ravana (RAH-vuh-nuh), and rescues his wife Sita (SEE-tuh). For 10 points, name this avatar of Vishnu who lends his name to a Hindu epic by Valmiki (val-MEE-kee).  
ANSWER: **Rama**

8. In 1974, Oliver Bickar created a “fake eruption” of this state’s Mount Edgecumbe (EJ-com) by burning over one hundred tires in its crater. Chris McCandless’s time living in an abandoned bus in this state inspired Jon Krakauer (KRAA-kow-er) to write *Into the Wild*. This state was where Balto led a team that delivered diphtheria serum to Nome. This state, where a failed project at Ketchikan (CATCH-ik-en) became known as the “bridge to nowhere,” is the site of the Iditarod Sled Dog Race. For 10 points, name this physically largest U.S. state.  
ANSWER: **Alaska**

9. A football star in this novel fathers a child on Sibyl Frey and dies after being paralyzed in a game. An assassination in this novel is effected by Sadie Burke’s revelation of an affair to Tiny Duffy. A Ph.D. thesis about Cass Mastern is abandoned by this novel’s narrator, who has a theory of the world called the “Great Twitch.” This novel’s protagonist, Jack Burden, works for the politician Willie Stark. For 10 points, name this novel based on the life of Huey Long, written by Robert Penn Warren.  
ANSWER: ***All the King’s Men***

10. Statins are derived either synthetically, or through this biological process. *E. coli* produce hydrogen gas and carbon dioxide in the “mixed acid” form of this process. In this process, NADH directly reduces the pyruvate (pai-ROO-vayt) made from glycolysis (glai-KAH-loh-sis). One type of this process produces a substance that builds up in muscles during exercise Yeast use another version of this pathway to create ethanol. For 10 points, name this metabolic pathway that generates ATP in the absence of oxygen and has “lactic acid” and “alcohol” types.  
ANSWER: **fermentation** [lactic acid **fermentation**; or alcohol **fermentation**; or ethanol **fermentation**; or mixed acid **fermentation**; or word forms such as **fermenting**; prompt on **anaerobic respiration**]

11. A restoration made on this painting in 2009 darkened the red-orange tunnel directly behind the main scene. On its right side, the artist painted himself scribbling into a notebook. This painting contrasts the stoic, unemotional crowd that watches the central scene and a woman in the bottom left corner, who raises her left hand to shield herself from viewing who may be her son. This painting takes place in the Jefferson Medical College auditorium, where the title doctor watches over a bloody operation. For 10 points, name this medical painting by Thomas Eakins.  
ANSWER: *The* ***Gross Clinic***

12. Hexagonal crystals within this type of cloud refract light into sun dogs. When these structures form “hooks” on their ends, they are known as “mare’s tails.” These clouds tend to appear about thirty-six hours before a hurricane, and were used in the first hurricane forecasting system. The precipitation of snowflakes from these clouds causes “fall streaks.” These clouds, formed by deposition, signal an upper-level jet streak or an approaching warm front. For 10 points, name this type of cloud made completely of ice and found very high in the atmosphere.  
ANSWER: **cirrus** clouds [or **cirrostratus** clouds; do not accept or prompt on “stratus”]

13. A king of these people deposed his cousin, Hilderic (hil-DER-ik), for converting to Catholicism. Augustine of Hippo died during a siege by these people. Belisarius ended the influence of these people after defeating their king Gelimer (GEH-luh-mur). These people, under the leadership of Genseric, stripped the roof tiles off a temple to Jupiter, three years after the Huns were turned back from Rome, during their 455 sack of the city. For 10 points, name these people who occupied Carthage and now lend their name to the destruction of property.  
ANSWER: **Vandal**s

14. For a string, a form of this quantity is equal to the square root of tension over the mass density. This quantity can be calculated as frequency over wavenumber. This quantity squared multiplies the position term in the wave equation. Materials in which this quantity remains constant regardless of wavelength are termed nondispersive, and the refractive index relates two values of this quantity for light. It is generally equal to frequency times wavelength. For 10 points, identify this quantity which, in kinematics, is the rate of change in position.  
ANSWER: phase **velocity** [or wave **velocity**; or **speed** of light]

15. Islamic scholars believe all children fathered by this man were sets of male-female twins. In the Qur’an’s “Cow Sura,” Iblis’s refusal to bow before this man led Allah to banish Iblis to earth, creating the Islamic analogue of Satan. This Islamic prophet, who witnessed the fall of the Black Stone from Heaven, was wedded to Hawwa (hah-WAH) and begins the series of prophets that ends with Muhammad. For 10 points, name this person revered in Abrahamic faiths as the first man.  
ANSWER: **Adam**

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl**  **State Championships 2015**  **Round 2**  **Directed Round** |

1A. What three word Latin term refers to a character or event that improbably and suddenly fixes events at the end of a dramatic plot?  
ANSWER: **deus ex machina**

1B. What Pauline epistle declares “love is patient, love is kind,” describes becoming an adult and putting away childish things, and controversially instructs women be silent in churches?  
ANSWER: **1 Corinthians** [or **First** Epistle to the **Corinthians**; prompt on **Corinthians**]

2A. What Italian composer wrote *L’Orfeo* (lor-FAY-oh), the earliest opera still regularly performed today?   
ANSWER: Claudio **Monteverdi** [or Claudio Giovanni Antonio **Monteverdi**]

2B. What abundant polymer (PAH-lih-mur) found alongside cellulose and pectin in the cell walls of wood provides structural support and assists in water transport?  
ANSWER: **lignin**

3A. This is a 20-second calculation question. What is the equation, in standard form, of the line with slope -2 that passes through the point (5,3)?  
ANSWER: **2x plus y equals 13** [or **-2x minus y equals -13**]

3B. This is a 20-second calculation question. What is the interquartile range of the following set of numbers: 1, 3, 6, -2, 5, -1, 0, 13, 2, 7?  
ANSWER: **6**

4A. What phenomenon occurs when electrons are delocalized such that a molecule rapidly interconverts between different possible Lewis structures?  
ANSWER: **resonance** [or **resonance** structures]

4B. What Senator from Iowa promised to “make ‘em squeal” in a campaign ad against Bruce Braley and delivered the Republican response to the 2015 State of the Union?  
ANSWER: Joni **Ernst**

5A. What politician mandated using the Latin alphabet and banned wearing the fez as part of his Six Arrows ideology, and is known as the “father of the Turks?”  
ANSWER: Mustafa **Kemal** Ataturk [or Kemal **Ataturk**]

5B. What is the name for the single-humped camels found in northern Africa and the Arabian peninsula?  
ANSWER: **dromedary** [or ***Camelus dromedarius***; or **Indian camel**; prompt on **Arabian camel**]

6A. What city was Neville Chamberlain returning from when he proclaimed “peace for our time” in 1938?  
ANSWER: **Munich**

6B. Xuanzang (ZWON-zong), or Tripitaka (trip-ee-TAH-kuh), is a central character in what classic Chinese novel that also features the monkey king Sun Wukong (woo-KONG)?  
ANSWER: ***Journey to the West*** [or ***Xi You Ji***]

7A. What detective, created by Dashiell Hammett, attempts to find the title statue in *The Maltese Falcon*?  
ANSWER: **Sam** Spade [or **Spade**]

7B. What Charles Dickens character escapes his stepfather Mr. Murdstone and eventually marries Agnes Wickfield?  
ANSWER: David **Copperfield** [or **David**]

8A. This is a 30-second calculation question. The faces of a solid cube are painted, and the cube is subsequently broken into twenty-seven equally sized cubes. What is the ratio of painted to unpainted faces in the new set of cubes? Give your answer as a fraction in simplest form.  
ANSWER: **1/2**

8B. This is a 30-second calculation question. Find all values of x, in radians, such that 4 sine cubed x minus 4 sine squared x minus 3 sine x plus 3 equals 0. Express your answer in terms of an integer n.  
ANSWER: **pi over 2 plus 2 pi n**, **pi over 3 plus pi n**, and **2 pi over 3 plus pi n** [or **pi plus 2 pi n**, **pi over 3 plus 2 pi n**, **2 pi over 3 plus 2 pi n**, **4 pi over 3 plus 2 pi n**, and **5 pi over 3 plus 2 pi n**; do not accept or prompt on partial answers]

9A. What programming paradigm, exemplified by Java, uses properties such as inheritance, encapsulation, and polymorphism (pah-lee-MOR-fizm) to manipulate individual instantiations (in-stan-tee-EY-shunz) of classes?  
ANSWER: **object-oriented** programming [or **OOP**]

9B. What goalkeeper for Everton set a record with fifteen saves in the American soccer team’s 2014 World Cup loss to Belgium?  
ANSWER: Tim **Howard** [Timothy Matthew **Howard**]

10A. Name the politician who was the first director of the Budget Bureau and proposed a namesake plan to help Germany pay off its war reparations in 1924.  
ANSWER: Charles **Dawes** [Charles Gates **Dawes**]

10B. What five-letter Spanish word can be added before the word “comido” (koh-MEE-doh) to create a sentence that means “We have eaten?”  
ANSWER: **hemos** (EY-mohs)

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl**  **State Championships 2015**  **Round 2**  **Third Period, Fifteen Tossups** |

1. This hero gives a king an injury that can only be healed when the spear that inflicted the injury is scraped off and applied to the wound. He refuses to go into battle after he is forced to give his slave Briseis (bri-SAY-iss) to Agamemnon. During a duel, this hero chases his opponent around the walls of Troy three times before killing that man, the Trojan prince Hector. As a baby, this hero’s mother Thetis (THAY-tiss) dips him into the River Styx to make him invulnerable. For 10 points, name this Greek hero whose only weakness is his heel.  
ANSWER: **Achilles**

2. This artist was ridiculed for her poor freestyle performance on *Sway in the Morning*. As a guest rapper, she starts a song by saying over muted trumpets “I got one more problem with you, girl,” and ends her rap with “I got ninety-nine problems but you won’t be one - like what!” Rita Ora sings “This is the web, web that you weave” in the chorus of a single from this artist’s album *The New Classic*. In another single from that album, she sings “I’m in the fast lane from L.A. to Tokyo.” For 10 points, name this Australian rapper of “Black Widow” and “Fancy.”  
ANSWER: **Iggy Azalea** [or Amethyst Amelia **Kelly**; prompt on **Iggy**; prompt on **Azalea**; do not accept “Azealia Banks”]

3. In one of this author’s poems, the speaker excuses his beloved by asking “What could she have done, being what she is? Was there another Troy for her to burn?” This poet loved the revolutionary Maud Gonne, and he described a place where “all neglect monuments of unageing intellect” in a poem about “no country for old men.” His best-known poem includes the line, “Things fall apart; the centre cannot hold.” For 10 points, name this modernist Irish poet of “Sailing to Byzantium” and “The Second Coming.”  
ANSWER: William Butler **Yeats**

4. P-bodies contain many enzymes for degrading this molecule. The Kozak consensus is found in this molecule in eukaryotes (yoo-KAIR-ee-utz), and in prokaryotes an important binding site on it is designated by the Shine-Dalgarno sequence. This molecule is protected from degradation by polyadenylated (pah-lee-uh-DEE-nuh-lai-ted) tails, and it is processed by splicing out its non-coding introns before attachment to the ribosome (RAI-buh-zohm). For 10 points, name this molecule which acts as a template for translation and is transcribed from DNA.  
ANSWER: **mRNA** [**messenger RNA**; or **pre-mRNA**; prompt on **RNA**]

5. In this state, a woman named Amelia Boynton was gassed and beaten during Sheriff Jim Clark’s aggressive actions on the Edmund Pettus Bridge. The head of the Dexter Avenue Baptist Church started an “improvement association” in this state, which was also where marchers were attacked on “Bloody Sunday” and where four young girls were killed in a 1963 church bombing. In 1955, Rosa Parks was arrested for not giving up her bus seat in this state. For 10 points, name this southern state where the Selma march and the Montgomery Bus Boycott took place.  
ANSWER: **Alabama**

6. This quantity can be determined by examining the displacement of powder within Kundt (KOONT) tubes. For an ideal gas, this quantity is proportional to the square root of the gas’s heat capacities divided by its molar mass. It is often defined as the square root of bulk modulus divided by density. The speed of an object with relation to this quantity is given by the Mach number. A standard value of this quantity at sea level is 340 meters per second. For 10 points, identify this quantity that is the rate at which sonic waves travel through a material.  
ANSWER: **speed of sound**

7. This poem contrasts houses and rooms that are “full of perfumes” with the atmosphere, which is “not a perfume.” The speaker of this poem declares, “A morning glory at my window satisfies me more than the metaphysics of books,” and describes a voyeuristic woman he calls the “twenty-ninth bather” in a scene of nude men. This poem ends with the line, “I stop somewhere waiting for you,” shortly after the speaker sounds his “barbaric yawp over the roofs of the world.” For 10 points, name this poem by Walt Whitman which begins, “I celebrate myself.”  
ANSWER: ***Song of Myself***

8. In this country, farmers called “twenty-five-thousanders” were subject to the stringent Law of Spikelets (SPIKE-lets). This country’s government launched the Virgin Lands Campaign and promoted a pseudoscience called Lysenkoism (lai-SENK-oh-izm). A leader of this country planned the Holdomor (hahl-uh-doh-MOR) famine. This country’s kulak (KOO-lock) farmers benefited from its New Economic Policy but were targeted by the Five Year Plans. For 10 points, name this country where agriculture was collectivized under Joseph Stalin.  
ANSWER: **USSR** [or **Soviet** Union; or Union of **Soviet** Socialist Republics; or **Sovetskij** Soyuz; or **SSSR**; or **Soyuz Sovetskikh Sotsialisticheskikh Respublik**; prompt on **Russia**]

9. In the first of two linked bildungsromans (BIL-dungz-roh-mahnz) by this author, the title aspiring actor who offers a Romantic reading of *Hamlet.* He wrote about a resident of Wahlheim who writes agonized letters to Wilhelm. A character created by this author fails to save Gretchen from a dungeon after she is convicted of infanticide. He wrote a two-part closet drama about a scholar who vows never to be satisfied in a pact with Mephistopheles (meh-fih-STAH-fuh-leez). For 10 points, name this German author of*The Sorrows of Young Werther* (VAIR-tur) and *Faust.*  
ANSWER: Johann Wolfgang von **Goethe**

10. Friedrich Engels claimed that this item was the only equal to iron in revolutionary potential, and it provided Saxony’s nickname for the War of Bavarian Succession. It was popularized in Prussia by Frederick the Great, who planted it in a poorly-guarded royal garden. A disease affecting the Lumpers variety of this nightshade, caused by Phytophthora infestans (fai-tohf-THOR-uh in-FEST-ahnz), caused the emigration or starvation of two million peasants in the “Great Hunger.” For 10 points, name this tuber whose blight caused a famine in Ireland.  
ANSWER: **potato** [or ***S****olanum* ***tuberosum***]

11. This party’s leader in the largest parliament it sits in is Angus Robertson. In November 2014, this party launched its own newspaper, which often attacks rival party leader Jim Murphy and supports its new head, Nicola Sturgeon. Sturgeon took over leadership of this party, which controls the Holyrood (HAH-lee-rood) parliament, following the failure of a September 2014 referendum advocated by this party’s former head, Alex Salmond. For 10 points, name this party which advocates for independence from the United Kingdom in a country in the north of Britain.  
ANSWER: **SNP** [or **Scottish National Party**; prompt on Scottish **Nationalist**s; prompt on **Nat**s]

12. At the very end of the finale of one of this composer’s string quartets, the main theme is reprised multiple times, but each time it is interrupted by sudden rests. In another string quartet, this composer wrote variations on the melody of the song “Deutschland uber alles” (DOYTCH-lond oo-ber AH-less). This composer of the *Joke* and *Emperor* quartets imitated Turkish music in his *Military Symphony* and wrote a symphony whose second movement features a sudden loud chord. For 10 points, name this Austrian composer of the *Surprise Symphony*.  
ANSWER: Franz Joseph **Haydn**

13. In 2D SDS-PAGE, gradients of this quantity and of voltage are applied across the gel. At 25 Celsius, the voltage of a SHE cell is about -0.0592 times this quantity. Lead hydroxide solubility decreases as this quantity goes up because of the common ion effect. Halfway to the equivalence point, this quantity equals the pKa. A mix of hydrogen fluoride and sodium fluoride moderates this quantity according to the Henderson-Hasselbalch equation for buffers. For 10 points, name this quantity, the cologarithm of hydronium concentration, which is less than 7 for acids.  
ANSWER: **pH** [or **power of hydrogen**]

14. This actor notes that the five hundred years of brotherly love in Switzerland have only produced “the cuckoo clock.” In that film, this man plays a black marketeer named Harry Lime. Besides that role in *The Third Man*, this actor played a man who lives in a Florida estate called Xanadu (ZAH-nuh-doo), publishes the *New York Inquirer*, and was based on William Randolph Hearst. In that film, this actor’s character says “Rosebud” as he dies. For 10 points, name this actor who played the lead in and directed *Citizen Kane*.  
ANSWER: Orson **Welles** [or George **Welles**]

15. This country lies south of the Chicken’s Neck, or Siliguri (see-lee-GOOR-ee) Corridor, and its Sundarbans is the largest mangrove forest in the world. The Chakmas are a Buddhist tribe in its mountainous Chittagong (CHIT-uh-gong) Hill Tracts. This country could produce twenty million refugees from rising sea levels. The Meghna and Brahmaputra (brah-muh-POO-truh) Rivers flow into this country, which declared independence from Pakistan in 1971. For 10 points, name this low-lying country where the Ganges Delta opens into the Bay of Bengal.  
ANSWER: **Bangladesh** [People’s Republic of **Bangladesh**; or Gonoprojatontri **Bangladesh**]

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl**  **State Championships 2015**  **Round 2**  **Tiebreaker/replacement questions** |

1. He is not Courbet, but this artist’s lover Joanna Hiffernan appears in his *Symphony in White*. His *The Princess from the Land of Porcelain* is hung above the fireplace to F.R. Leyland’s dining room*.* Many of his nocturnes were inspired by Hiroshige (heer-OH-shee-gay) landscapes. His black and gold composition of fireworks over Battersea Bridge was attacked by John Ruskin for “flinging a pot of paint in the public’s face.” He also painted a woman in a white bonnet seated in a chair facing left. For 10 points, name this painter of a portrait of his mother.  
ANSWER: James Abbott McNeill **Whistler**

2. In a speech in this novel, a woman states that “heaven did not seem to be my home,” forcing her to fall out of it, and says she cannot marry her beloved because “he’s more myself than I am.” A woman in this novel is bitten by a dog, forcing her to stay with the Lintons, whose son Edgar she marries. This novel’s frame story begins as Mr. Lockwood arrives at Thrushcross Grange and asks Nelly Dean for details about its former inhabitants. For 10 points, name this novel about the families of Catherine Earnshaw and Heathcliff, written by Emily Brönte.  
ANSWER: ***Wuthering Heights***

3. These objects are often constructed using iterated function systems. A prominent example of these objects contains a huge cardioid flanked by smaller disks. The man who coined the term for these objects analyzed them in the paper “How Long Is the Coast of Britain,” where he expanded upon their non-integer Hausdorff dimension. An example of this object, created by repeatedly removing a central equilateral triangle from a larger one, is the Sierpinski triangle. For 10 points, name these self-similar geometric shapes that include the Julia and Mandelbrot sets.  
ANSWER: **fractal**s

4. A goddess from this modern-day country drinks seven thousand jars filled with beer that has been dyed to look like blood. A sun god of this country is cured of a venomous snakebite after he reveals his secret name. In the mythology of this country, dead souls are fed to the monster Ammit if found to be heavier than a feather. A god of this country is chopped into fourteen pieces by his evil brother Set but revived by his wife Isis. For 10 points, name this modern-day country in which Horus manifested as the pharaoh.  
ANSWER: **Egypt** [Arab Republic of **Egypt**; or Gumhuriyat **Misr** al-Arabiyah]

5. A depiction of a fox, a crow, and cheese on this object’s bottom edge was aligned with an Aesop fable after Bernard de Montfaucon (mont-fah-COHN) rediscovered it. A mysterious man named Wadard is identified by its text, which also includes the phrase “EDWARDUS REX” in black capital letters. Depictions on this Romanesque artwork show a flaming red star overhead representing Halley’s Comet and an arrow through the eye of Harold Godwinson, the loser at Hastings. For 10 points, name this long tapestry depicting the Norman conquest of England.  
ANSWER: **Bayeux** Tapestry

What British playwright of *Betrayal* wrote a play in which the hit men Ben and Gus are ordered to kill one another, entitled *The Dumb Waiter*?  
ANSWER: Harold **Pinter**

This is a calculation question. Find all x-intercepts of the graph of y equals x cubed plus 3 x squared plus x plus 3.  
ANSWER: **(-3,0)** [or **x = -3**, y = 0]