**VHSL Regular Season 2016-2017 - Round 04 - First Period, Fifteen Tossups**

1. Every integer greater than two and possessing this property can be expressed as the sum of two primes, according to Goldbach's conjecture. All known perfect numbers have this property. At variance with the sine function, the cosine function has this property because cosine of *x* equals cosine of negative *x* and cosine is symmetric about the y-axis. For 10 points, what property is possessed by integers divisible by two, the opposite of odd numbers?
ANSWER: **even** [or obvious equivalents]

2. Adherents of this religion take a vow of "asteya," a promise not to steal. The two sects of monks in this religion have names meaning "white-clad" and "sky-clad," with the latter not wearing clothes. The final "teaching god," or tirthankara (TURF-en-KARR-uh), in this religion was Mahavira. Some devotees of this religion go as far to sweep the ground to avoid harming insects. For 10 points, name this Indian religion which preaches ahimsa or non-violence.
ANSWER: **Jainism** [or **Jain** dharma]

3. Over half of Angola's supply of this product comes from its exclave of Cabinda. Ken Saro-Wiwa (SAH-roh WEE-wah) was executed for his campaign against a company seeking this product in Nigeria. After seven years of absence, Indonesia rejoined a group of exporters of this product in 2016. Distributors for this product include Royal Dutch Shell, and Saudi Arabia's economy depends on it. For 10 points, name this product whose exporters are members of OPEC.
ANSWER: **oil** [or **petroleum**]

4. The protagonist of this novel retrieves his sister Gertrude, who has become a prostitute, and lodges with Mrs. Lithebe. In this novel, the protagonist's son Absalom is the only conspirator executed for the murder of the reformer Arthur Jarvis. This novel describes a journey to Johannesburg undertaken by Reverend Stephen Kumalo. For 10 points, name this South African novel by Alan Paton.
ANSWER: ***Cry, the Beloved Country***

5. At the beginning of this opera, a nobleman sings about his philandering in the aria "Questa o quella." This opera is based on Victor Hugo's play *Le Roi S'Amuse* (luh RWAH sah-MYOOS). In this opera, the title character hires the killer Sparafucile (spar-uh-FOO-chee-lay) to kill a man who sings "La donna e mobile (MOHB-lee-YAY)." For 10 points, name this opera by Giuseppe Verdi about a hunchbacked jester.
ANSWER: ***Rigoletto***

6. This man gifted cheese to Antonio Gutiérrez after losing to his forces near Tenerife, where he lost his arm. This man deliberately used a telescope with his blind eye to ignore an order to stand down before the Battle of Copenhagen. This winner of the Battle of the Nile in 1798 faced a combined Franco-Spanish army seven years later, but his forces led by the *HMS Victory* emerged unscathed. For 10 points, name this English admiral who was killed at the Battle of Trafalgar.
ANSWER: Horatio **Nelson**

7. Naomi Wolf's book *The Beauty Myth* is a key text in this social movement's modern "third-wave" component. Another book about this movement begins by discussing the "problem that has no name." That book by Betty Friedan is said to have inaugurated its "second-wave." The passage of the Equal Rights Amendment is the frequent goal of this movement in America. For 10 points, name this broad class of social movements which seeks to give rights to women.
ANSWER: **feminism** [or **feminist**]

8. Thermal radiation that permeates the entirety of this entity at about 2.7 Kelvins is the CMBR. This entity grew exponentially during the epoch of inflation. Hubble's constant is changing because the expansion of this entity is accelerating. Most of the mass of this entity occurs as dark matter. This entity is about 13.8 billion years old. For 10 points, what massive structure encompassing all existing matter and space is thought to have originated from a "Big Bang"?
ANSWER: **universe**

9. One of these animals was turned to stone with the Teumessian Fox after it started to relentlessly chase it. Fifty of these animals, including Tigris, killed Actaeon after he was transformed into a deer. Argus was a faithful one of these animals that died immediately upon recognizing his master. An animal of this type with three heads guarded over the Greek underworld. For 10 points, name this kind of animal that includes the fabled Cerberus.
ANSWER: **dog**s

10. This agreement resolved issues raised by the proposal of the failed Tallmadge Amendment. Thomas Jefferson wrote it was "a reprieve only, not a final sentence" and suggested war was imminent. This agreement was basically repealed when Stephen Douglas' Kansas-Nebraska Act allowed territories to vote on the issue themselves. For 10 points, what 1820 agreement prohibited slavery in American territories above the 36th parallel north?
ANSWER: **Missouri Compromise**

11. A member of this family expelled the Montoneros from his political party. That member's wife, Isabel Martinez, became president of her country in 1974. Another president from this family enjoyed support from workers referred to as the "decamisados" (DEY-comm-ee-SAH-dohz) or "shirtless ones." An actress who married into this family became a charismatic First Lady known as "Evita." For 10 points, what family's members included a President of Argentina named Juan?
ANSWER: **Peron** (PUH-rone) [or Juan **Peron**; or Eva **Peron**]

12. R.A. Fisher attempted to discredit this man's work by claiming his results were implausibly close to the ideal 3:1 ratio of phenotypes (FEE-no-types). This man's work supplanted the theory of blending. This man's namesake laws state that each pair of alleles (uh-LEELZ) is inherited independently of any other pair and that one allele dominates over the other. For 10 points, name this monk who performed hereditary experiments with pea plants.
ANSWER: Gregor Johann **Mendel**

13. This company was originally founded by Martin Eberhard, who was forced out in 2008. In May 2016, a man using one of this company's products crashed into a tractor-trailer while apparently watching a Harry Potter movie. The previous year, hackers claimed they could take control of this company's Model S car. For 10 points, what automotive company chaired by Elon Musk produces electric cars with autonomous driving capabilities?
ANSWER: **Tesla** Motors, Incorporated

14. A member of this family attacks a sick old woman's camellia bushes after she insults his father. Another member of this family demonstrates in court that Mayella and Bob Ewell are lying, but fails to win an innocent verdict for the black man Tom Robinson. For 10 points, name this family in Harper Lee's *To Kill a Mockingbird* whose members include Jem, Scout, and Atticus.
ANSWER: the **Finch** family

15. In his first appearance, this superhero was created when he tried to rescue Rick Jones. He is hunted by General "Thunderbolt" Ross and the military. Because of a television show featuring Lou Ferrigno, this superhero's catchphrase is sometimes the threat "You wouldn't like me when I'm angry." This hero was a brilliant physicist who was exposed to a gamma bomb. For 10 points, what green-skinned superhero uses his strength to smash things?
ANSWER: The Incredible **Hulk** [or **Bruce**; or **David**; or **Banner**]

 **VHSL Regular Season 2016-2017 - Round 04 - Directed Period**

1A. In November 1938, numerous German civilians attacked Jews and destroyed their businesses in an event named the "night of" what material?
ANSWER: **crystal** [or broken **glass**; or **Kristallnacht**]

1B. What Biblical character is killed by Joab during the Battle of Ephraim Wood after leading an unsuccessful rebellion against his father?
ANSWER: **Absalom**

2A. The line "Louis, I think this is the beginning of a beautiful friendship" ends what film starring Humphrey Bogart and Ingrid Bergman?
ANSWER: ***Casablanca***

2B. What English novelist wrote *Tom Jones* and satirized a Samuel Richardson novel in *Shamela* (SHAM-uh-LUH)?
ANSWER: Henry **Fielding**

3A. This is a 20-second calculation question. Jimbo has a bag with one green ball, one yellow ball, and two red balls. If Jimbo removes a ball at random, and removes another ball at random without replacement, what is the probability he picks both red balls?
ANSWER: **1/6**

3B. This is a 20-second calculation question. Find the inverse of the function f of x equals two x minus four.
ANSWER: f inverse of x equals **one half x plus two** [or f inverse of x equals zero **point five x plus two** or f inverse of x equals the quantity **x plus four over two** or f inverse of x equals the quantity **x plus four divided by two**]

4A. What hormone secreted from beta cells in the islets of Langerhans opposes glucagon?
ANSWER: **insulin**

4B. What Latin word is used to designate either the 13th or 15th day of the month on a calendar?
ANSWER: **ides**

5A. Big Daddy is dying of cancer in what play by Tennessee Williams?
ANSWER: ***Cat on a Hot Tin Roof***

5B. Functions, such as polynomials, that possess what property lack holes, jumps, and vertical asymptotes on their graph?
ANSWER: **continuous** [or **continuity**; or word forms]

6A. What class of molecules, with hydrophilic heads and hydrophobic tails, make up the namesake bilayer of a cell membrane?
ANSWER: **phospholipid**s (FOSS-fo-LIP-ids)

6B. The Spanish word for "shadower" lends its name to what kind of wide-brimmed hat, popularly worn in Mexico?
ANSWER: **sombrero**

7A. Unlike most of Asia, the majority of the Philippines and East Timor practice what religion?
ANSWER: **Christian**ity [or **Catholic**ism]

7B. What founder of the Red Army was an opponent of Stalin and was later assassinated in Mexico?
ANSWER: Leon **Trotsky** [or Lev Davidovich **Bronstein**]

8A. This is a 30-second calculation question. A sphere is placed inside a cube with no room to spare in any direction. If the diameter of the sphere is 6 inches, find the exact volume in cubic inches inside the cube but outside the sphere
ANSWER: **216 minus 36 pi** cubic inches

8B. This is a 30-second calculation question. What is the value of cosine of seventy-five degrees squared minus sine of seventy-five degrees squared?
ANSWER: **-sqrt(3)/2** [or **negative square root of 3 over 2**]

9A. The 1892 Homestead Strike was against a company owned by what Scotsman who would later sell his company to J.P. Morgan?
ANSWER: Andrew **Carnegie**

9B. What character of the Mon Calamari race, known for his line "It's a trap!", reappeared in the 2015 film *Star Wars: The Force Awakens*?
ANSWER: Admiral **Ackbar** [or **Gial** Ackbar]

10A. What Massachusetts Senator was insultingly referred to as "Pocahontas" by Donald Trump?
ANSWER: Elizabeth **Warren** [or Elizabeth **Herring**]

10B. What British poet and Catholic priest wrote "Pied Beauty" and "God's Grandeur"?
ANSWER: Gerard Manley **Hopkins**

 **VHSL Regular Season 2016-2017 - Round 04 - Third Period, Fifteen Tossups**

1. A section of this poem ends by juxtaposing the Buddha's "burning burning burning burning" with Saint Augustine's "O Lord thou pluckest me out." This poem's final section, "What the Thunder Said," concludes with a triple repetition of the word "shantih" (SHAHN-tee). This poem begins, "April is the cruelest month." For 10 points, name this long poem by T. S. Eliot.
ANSWER: *The* ***Waste Land***

2. A large underground lake lies beneath this desert in the Dragon's Breath Cave. The Etosha and Makgadikgadi (mock-GAH-deek-GAH-dee) salt pans lie within this desert, which is inhabited by the San Bushmen. The Okavango River never reaches the sea because it stops in this desert. Like the Namib Desert to its west, this desert provides a home for meerkats. For 10 points, name this desert that occupies most of Botswana in southern Africa.
ANSWER: **Kalahari** Desert

3. This ruler faced a nine-year rebellion led by chieftains from Tyrone, which resulted in Robert Devereux being placed under house arrest. This ruler supported the Dutch revolt through the Treaty of Nonsuch. Several attempts to overthrow this queen were foiled by Francis Walsingham. While serving her, Francis Drake raided Cadiz and fended off the Spanish Armada. For 10 points, name this last Tudor ruler of England, nicknamed the "Virgin Queen."
ANSWER: **Elizabeth I** [prompt on Elizabeth; prompt on Bess]

4. A ruler with this name met Hattusili (HAH-too-SUH-lee) III to sign the first known peace treaty in history. The third ruler with this name decisively conquered the mysterious Sea Peoples. The second ruler with this name succeeded Seti I and won a tactical victory at Kadesh. That ruler with this name had forces fight the Hittites at the largest chariot battle in history. For 10 points, the second Egyptian pharaoh with what name was known as the "great"?
ANSWER: **Ramesses** (RAM-seez) [or **Ramesses** the Great; or **Ramesses** II; or **Ramesses** III]

5. This poem's speaker asks, "On what wings dare he aspire? What the hand dare seize the fire?" Later in this poem, the speaker asks, "Did he smile his work to see? Did he who made the Lamb make thee?" This poem wonders what "immortal hand or eye" could frame the "fearful symmetry" of the title creature. For 10 points, name this poem about an animal "burning bright," a work of William Blake.
ANSWER: "The **Tyger**"

6. This composer's third symphony ends with a theme-and-variations on a melody from his ballet *The Creatures of Prometheus*. A C minor funeral march is the second movement of that third symphony, which was rededicated to the "memory of a great man" instead of Napoleon when the latter declared himself emperor. For 10 points, name this composer of the *Eroica* Symphony, whose fifth symphony begins with a "fate knocking at the door" motif.
ANSWER: Ludwig van **Beethoven**

7. Robert de Boron's account of this object states that since it was inspired by Jesus's Last Supper, a part of it that was always empty symbolized the betrayal of Judas. Almost everyone who sat in the "Siege Perilous" of this object would meet death, since the wizard Merlin enchanted it. Lamorak, Kay, and Lancelot were some of the warriors who assembled around it. For 10 points, name this piece of furniture around which the knights in Camelot gathered.
ANSWER: **Round Table**

8. Nicole Hunter dies in this character's arms while in Monaco in a 2010 game subtitled "Blood Stone." The video game *Perfect Dark* is a spiritual successor to another game starring this character, who defeats Baron Samedi in the final level "Temple." This character travels to Japan and defeats Rafael Drake in the game *Nightfire*. He was voiced by Sean Connery in a third-person shooter called *From Russia with Love*. For 10 points, name this British secret agent.
ANSWER: James **Bond** [or **007**; or **James**]

9. Members of the Conidae (CONE-ih-dye) class in this phylum operate their chitinous (KITE-un-us) radulae (RAD-yu-lye) like a venomous harpoon to sting prey. The visceral mass of animals in this phylum is covered by the mantle, which may secrete calcium carbonate. This phylum includes cephalopods (SEF-uh-luh-pods) such as squids and bivalves like oysters. For 10 points, name this phylum that contains snails and clams.
ANSWER: **mollusk**s [or **Mollusca**]

10. In the first novel in a trilogy by this author, the protagonist crosses the Mexican border with Jimmy Blevins. In another novel by this author, the sheriff Ed Tom Bell investigates a series of murders committed by the hit man Anton Chigurh (CHIH-ger). This author created John Grady Cole in *All the Pretty Horses.* For 10 points, name this novelist of *The Road* and *No Country for Old Men*.
ANSWER: Cormac **McCarthy**

11. Though not colloids, the electric field generated by particles in these substances generates a characteristic Debye (Duh-BYE) length of influence. These substances can be confined using a toroidal magnetic field in a tokamak, which is a potential path to fusion. Sudden electrostatic discharges in the atmosphere generates this substance and thunder in the form of lightning. For 10 points, what "fourth state of matter" consists of highly ionized particles and is found in stars?
ANSWER: **plasma**s

12. The neurotransmitter GABA is a non-standard one of these molecules. In nature, these molecules almost always occur as their L isomer (EYE-so-mer). These molecules are usually NOT added for U-A-A, U-A-G, or U-G-A. tRNA carries them to the ribosome for incorporation into the growing peptide chain during translation. For 10 points, name these molecules such as glycine (GLY-seen) and tryptophan (TRIP-toh-fan) that form the building blocks of proteins.
ANSWER: **amino acid**s

13. The exact value of the infinite summation of the reciprocals of these numbers is the subject of the Basel problem, which equals pi-squared over six. The *n*th one of these numbers can be defined as the *n* minus first one of them plus 2 *n* minus one. A binomial that is the difference of two of them can be factored into the form quantity a plus b times quantity a minus b. For 10 points, name these numbers that only have two, equal integer factors, such as one, four, and nine.
ANSWER: perfect **square**s [prompt on integers; prompt on natural numbers]

14. In 2012, a version of this painting was sold in an auction for nearly $120,000,000. Versions of this painting were stolen from two different art museums in 1994 and 2004. Two boats can be seen in the background of this painting whose swirling orange sky is thought to represent an eruption of Krakatoa. For 10 points, name this painting whose bald central figure is grabbing his face and performing the title action on a bridge, a painting by Edvard Munch (Edward Moonk).
ANSWER: *The* ***Scream*** [or ***Skrik***; or *Der* ***Schrei der Natur***]

15. This dynasty's powerful chancellor, Li Linfu, avoided appointing native-born Chinese as generals. This dynasty's destruction resulted in the Five Dynasties and Ten Kingdoms period. It was challenged by a revolt from former general An Lushan and by a revival of the Zhou (JOE) dynasty under the only female ruler of China, Empress Wu. Li Po and Du Fu were both famous poets during this dynasty. For 10 points, what Chinese dynasty reigned from 618 to 907?
ANSWER: **Tang** dynasty

 **VHSL Regular Season 2016-2017 - Round 04 - Tiebreaker Questions**

1. After offending this god, Lycurgus killed his son after believing he was a patch of ivy. In an Aristophanes play, this god descends to the underworld to revive Euripides. He drove the women of Thebes mad, causing his aunt Agave to kill his cousin, King Pentheus. This god was accompanied by Silenus and the Maenads. His mother Semele (Sem-ill-ee) was killed when she asked Zeus to reveal his true form. For 10 points, name this Greek god of wine and reverie.
ANSWER: **Dionysus** [or **Bacchus**]

2. A "stateful" type of this software has been part of Windows since Windows XP, though it does not perform deep packet inspection. This network security software controls incoming and outgoing network traffic, acting as a barrier between a trusted network and potentially untrustworthy networks such as the Internet. For 10 points, the word "great" is commonly combined with the term for what software when referring to China's internet censorship?
ANSWER: **firewall**

3. A king of this country named Sebastian was long rumored to return and rule after his 1578 disappearance. On All Saints' Day in 1755, its capital was hit with a massive earthquake. Six kings named Joao (JOH-ow) or John have ruled this country. A 1494 treaty gave this country rights to lands east of the Cape Verde Islands. For 10 points, the Treaty of Tordesillas (TOR-duh-SEE-uhs) was signed between Spain and what Iberian neighbor?
ANSWER: Kingdom of **Portugal** [or Kingdom of **Portugal**, Brazil, and the Algarves; or **Portuguese** Empire]

4. A 1948 photograph taken in this city by Nat Fein depicts a dying sportsman as he "Bows Out." Charles C. Ebbets is usually credited with a photograph showing several men eating lunch during the construction of the RCA Building in this city. Alfred Eisenstaedt (AY-sen-stat) took a photo of a sailor kissing a nurse during a victory parade held in this city. For 10 points, name this American city, the setting of the photograph *V-J Day in Times Square*.
ANSWER: **New York** City

5. This author modeled Adrian, Earl of Windsor on her husband in her novel about Lionel Verney, *The Last Man.* In another novel by this author, Captain Robert Walton encounters the title character at the North Pole. This author wrote about a "Modern Prometheus," a scientist who creates a frightening giant man. For 10 points, name this science fiction novelist who wrote *Frankenstein.*
ANSWER: Mary **Shelley**

Burt's rectangular prism has side lengths of 1 units, 2 units and 8 units. What is the total surface area of Burt's prism?
ANSWER: **52** units squared

What cornerstone operation of calculus gives the slope of the tangent line for another function at a given point?
ANSWER: **derivative**