**VHSL Regular Season 2016-2017 - Round 10 - First Period, Fifteen Tossups**

1. Refluxing involves performing this process on a reactant before cooling it. This process occurs when crossing *below* the line connecting the triple point and critical point. The enthalpy of this process is equivalent to the negative enthalpy of condensation. It occurs when a liquid's vapor pressure equals the atmospheric pressure. For 10 points, what process occurs when liquid water reaches 100 degrees Celsius and transforms into a gaseous state?
ANSWER: **boil**ing [or **vaporizing**; or **evaporation**; or word forms]

2. If one of these things has the injective and surjective properties, it is also bijective. The involution type of these things is its own inverse. The horizontal line test can be used to check if one of these things has the one-to-one property. Points in the domain of these expressions are mapped to points in the range. For 10 points, what relations give one output for every input?
ANSWER: **function**s

3. This artist painted Roman soldiers wearing Renaissance armor in *The Taking of Christ*. Luke and Cleopas sit at a table in both versions of this painter's *The Supper at Emmaus* (em-MAY-us). This man used the *chiaroscuro* (kee-AH-roe-SCOO-roe) technique in a painting of a tax collector pointing to himself while being approached by Jesus. For 10 points, name this Baroque artist of *The Calling of Saint Matthew*.
ANSWER: **Caravaggio** [or Michelangelo **Merisi**]

4. In a novel by this author, the revelation that Angela Vicario is not a virgin leads to the murder of Santiago Nasar (NAH-sar). In another novel by this author, Fermina Daza (fair-MEE-nuh DAH-zuh) is pressured into marrying a doctor who combats the title disease. He traced several generations of the Buendia (bwen-DEE-uh) family in another novel. For 10 points, name this Colombian novelist of *Love in the Time of Cholera* and *One Hundred Years of Solitude.*
ANSWER: Gabriel **Garcia Marquez**

5. The most recent game in this series features a level called Cloudtop Cruise, in which players traverse through thunderclouds and a giant beanstalk. Two players control a single vehicle in the "Double Dash" installment of this game series for the Gamecube. The "Special Cup" in many games of this series ends with a challenging level called Rainbow Road. For 10 points, name this racing series made by Nintendo, in which Luigi and his brother are playable characters.
ANSWER: ***Mario Kart*** [prompt on *Super Mario Brothers*]

6. This man used a lyre to kill his music teacher Linus after the latter pointed out his flaws. Atlantis supposedly existed beyond the "Pillars of" this Greek figure. He used his arrows to defeat birds with bronze beaks and feathers made of metal nearby Lake Stymphalia. Eurystheus (YOU-riss-TEE-uss) ordered this hero to clean the Augean and slay the Nemean Lion as part of a series of tasks. For 10 points, name this Greek hero who performed twelve labors.
ANSWER: **Heracles** [or **Hercules**]

7. This country's "Smoke Tragedy" in 1945 led to 355 deaths at El Teniente (TEN-ee-en-TAY). During another disaster in this country, the media received video journals hosted by a man known as "Super Mario," updating the world on his 32 colleagues. That disaster here took place at Copiapo (COH-pee-AH-poh), a location that produces gold and copper. For 10 points, what South American country was the site of a 2010 accident that trapped many miners?
ANSWER: Republic of **Chile**

8. For over 27 years, this empire fought a frustrating war with the Marathas. Most of its emperors lived in a structure called the Red Fort. This empire's ruler Aurangzeb imprisoned his own father at Agra Fort. Its size tripled under the reign of its third ruler, Akbar the Great. Another ruler of this empire named Shah Jahan built a beautiful tomb for his favorite wife. For 10 points, what Indian empire built such structures as the Taj (TAHJ) Mahal?
ANSWER: **Mughal** (MOOG-ull) Empire [or **Mogul** Empire; or **Gurkani**]

9. An oft-quoted line about this battle was that it was "won on the playing fields of Eton (EEE-ton)." An unsupported cavalry charge by Marshal Ney was a crucial moment in this battle. It was the last major victory for the Prussian general Gebhard von Blucher (BLOO-her). The Hundred Days ended and a man was exiled to Saint Helena after the Duke of Wellington won this battle. For 10 points, what June 1815 battle was Napoleon's final defeat?
ANSWER: Battle of **Waterloo**

10. In this opera, a woman throws a flower to the protagonist after singing about how "love is a rebellious bird." In this opera, the title character sings the "Habanera" and her lover, the bullfighter Escamillo (ess-kuh-MEE-yo), sings the "Toreador Song." The soldier Don Jose stabs the title woman after she leaves him in this opera. For 10 points, name this opera by Georges Bizet (bee-ZAY) about a flirtatious gypsy.
ANSWER: ***Carmen***

11. This constellation's namesake meteor shower is most visible during mid-October, and results from material radiating from Halley's comet. An asterism consisting of the three stars Alnitak, Alnilam, and Mintaka comprise this constellation's "belt". The brightest stars in this constellation are Betelgeuse (BEET-uhl-jooz) and Rigel (RAY-juhl). For 10 points, what constellation is named for a hunter from Greek mythology?
ANSWER: **Orion**

12. This world leader tried to address his country's food shortages with the Virgin Lands Campaign. He gave the so-called "Secret Speech" that denounced the "cult of personality" of a recently deceased General Secretary and predecessor. This man proclaimed "we will bury you" to western ambassadors and also reportedly once banged his shoe in protest at the United Nations. For 10 points, what Soviet leader took power in 1953 in the wake of Stalin's death?
ANSWER: Nikita **Khrushchev**

13. This author wrote about the rise and downfall of the socialite Lily Bart in one novel. In another novel, she wrote about the unfulfilled love affair between the Countess Ellen Olenska and Newland Archer. The title character of another of her novels attempts suicide with Mattie Silver by sledding into a tree. For 10 points, name this American novelist of *The Age of Innocence* and *Ethan Frome.*
ANSWER: Edith **Wharton**

14. The degree to which a substance deviates from this thing is quantified by the compressibility factor. An equation named for this substance is modified by the van der Waals equation. This theoretical substance has no intermolecular forces, consisting of point particles that only interact via elastic collisions. For 10 points, what substance's namesake law equates the product of pressure and volume with the product of moles of substance, gas constant, and temperature?
ANSWER: **ideal gas**

15. This author wrote about the end of the rivalry between the sheriff Jack Potter and Scratchy Wilson in his story "The Bride Comes to Yellow Sky." He wrote about a poor girl who is driven to prostitution in his novella *Maggie: A Girl of the Streets*. In a Civil War novel by this author, Henry Fleming earns the title wound. For 10 points, name this author of *The Red Badge of Courage.*
ANSWER: Stephen **Crane**

 **VHSL Regular Season 2016-2017 - Round 10 - Directed Period**

1A. What entertainer, who is currently out on bail after surrendering to Pennsylvania police, has been accused of rape and sexual assault by over 50 women?
ANSWER: William "Bill" **Cosby** Jr.

1B. In 1956, what European country featured a revolt against its Communist government, the first major threat to Soviet control since the end of World War II?
ANSWER: **Hungary** [or **Hungarian** People's Republic]

2A. What type of hot spring periodically erupts due to a buildup of pressure?
ANSWER: **geyser**

2B. *Euskara* (yew-SKA-RAH) is the native name for what language isolate found in a namesake "Country" located on the border between Spain and France?
ANSWER: **Basque** (BASK)

3A. This is a 20-second calculation question. What is the product when the polynomial "x cubed plus x squared plus x plus 1" is multiplied by the quantity "x minus 1"?
ANSWER: **x to the fourth minus 1** [accept **x to the fourth power minus 1**, or **x to the power of four minus 1**]

3B. This is a 20-second calculation question. What is the difference of the median and the mean of the first four prime numbers?
ANSWER: **0.25**

4A. The architect Halvard Solness is the protagonist of what play by Henrik Ibsen?
ANSWER: *The* ***Master Builder*** [or ***Bygmester Solness***]

4B. The nihilist Bazarov (bah-ZAR-off) appears in what novel by Ivan Turgenev (tur-GAIN-yef)?
ANSWER: ***Fathers and Sons*** [or ***Ottsy i Dety***]

5A. What phosphate-containing reducing agent is generated in the last step of the light reactions in photosynthesis?
ANSWER: **NADPH** [or **NADP**-plus]

5B. What French Impressionist artist portrayed ballerinas in paintings such as *The Dance Class*?
ANSWER: Edgar **Degas** (day-GAH)

6A. Tenzing Norgay was a member of what ethnic group, known for guiding climbers on Mount Everest?
ANSWER: **Sherpa**

6B. What Portuguese prince encouraged overseas exploration and is sometimes claimed to have established a school for mapmakers?
ANSWER: Prince **Henry the Navigator** [or **Henrique**; or the Duke of **Viseu**; prompt on Henry]

7A. What is the term for the monomers consisting of a nitrogenous (ny-TRAW-juh-nus) base, phosphate groups, and deoxyribose (de-OX-ee-RY-bose) or ribose that make up nucleic (nu-CLAY-ic) acids?
ANSWER: **nucleotide**s [or deoxyribo**nucleotide**s; or ribo**nucleotide**s; or **NT**s]

7B. What term, which comes from the name of the Greek goddess of the rainbow, describes an object whose surface changes colors depending on the angle of view?
ANSWER: **iridescent**

8A. This is a 30-second calculation question. A diagonal of a 12-inch tall rectangular prism measures 13 inches. If one side of the base of the prism is 3 inches long, find, in cubic inches, the volume of the prism.
ANSWER: **144** cubic inches

8B. This is a 30-second calculation question. What is the sine of inverse tangent of negative one?
ANSWER: **-sqrt(2)/2** [or **-1/sqrt(2)**] [or **negative square root of 2 over 2** or **negative one over square root of 2**]

9A. The Roman phrase abbreviated SPQR refers to the people and what other important institution of Rome?
ANSWER: The Roman **Senate** [or **Senatus**]

9B. "Toomai of the Elephants" and "Rikki-Tikki-Tavi" appear in what collection of stories by Rudyard Kipling?
ANSWER: *The* ***Jungle Book***

10A. Hector kills what friend of Achilles, who goes into battle wearing Achilles' armor?
ANSWER: **Patroclus**

10B. Gumbo has a slimy texture since what vegetable, sometimes called ladies' fingers is added to it?
ANSWER: **okra** [or **okro**]

 **VHSL Regular Season 2016-2017 - Round 10 - Third Period, Fifteen Tossups**

1. A member of this group was elected to office as an "Anti H-Block" candidate and while imprisoned at HM Prison Maze. That member of this group died during a hunger strike and was named Bobby Sands. This group called a cease-fire a year before the Good Friday Agreement. In 1971, during the "Troubles," it began a guerrilla warfare campaign. For 10 points, what was the largest of the paramilitary groups dedicated to opposing U.K. control of Northern Ireland?
ANSWER: Provisional **Irish Republican Army** [or **IRA**; or **PIRA**; or **Óglaigh na hÉireann**]

2. A method of performing this action involving quotients of determinants is named for Gabriel Cramer. Common methods of performing this process include substitution, which requires solving for one variable and substituting it into another expression. For two variables, it can be graphically formulated as finding the intersection of two lines. For 10 points, what action involves finding the answer to problems such as x plus y equals ten and x minus y equals four?
ANSWER: **solving systems** of linear **equations** [or obvious equivalents; prompt on solving equations]

3. Shortly before this event, a man unsuccessfully tried to poison and drown himself after he failed to hit his target with a bomb. This event's perpetrator was a member of the Black Hand named Gavrilo Princip, who claimed he did not mean to kill the target's wife, Sophie, and also professed to be a Bosnian nationalist. For 10 points, what June 1914 event in Sarajevo (SARE-uh-YAY-voe) killed the heir to the Austro-Hungarian Empire and set off World War One?
ANSWER: **assassination** of Archduke **Franz Ferdinand** of Austria [or **murder** of Archduke **Franz Ferdinand** of Austria; or **assassination** of Archduke **Franz Ferdinand** Carl Ludwig Joseph Maria]

4. A mythical history by Geoffrey of Monmouth states that this ruler was succeeded by a Duke of Cornwall named Constantine. After this man is mortally wounded while fighting at the Battle of Camlan, he dies and is taken to the "island of the apples" named Avalon. This son of Uther Pendragon is betrayed by his nephew Mordred and wields the sword Excalibur. For 10 points, name this king from English mythology whose kingdom is Camelot.
ANSWER: King **Arthur**

5. An opera by this composer is introduced by the allegorical woman Public Opinion. A frequently-excerpted barcarolle (bar-kuh-"ROLE") opens the third act of his opera based on three stories by the title German writer. The music for the can-can originates from a comic opera by this composer about a mythological musician. For 10 points, name this French composer of *Orpheus in the Underworld* and *The Tales of Hoffmann.*
ANSWER: Jacques **Offenbach**

6. This party sponsored the *American Minerva* newspaper edited by Noah Webster. The Essex Junto (HOON-toe) consisted of members of this party who supported the Hartford Convention's grievances with the War of 1812. This party used the Alien and Sedition Acts to suppress rival newspapers. Its leader died in a duel with Aaron Burr. For 10 points, what early political party was led by Alexander Hamilton and was opposed by Thomas Jefferson's Republicans?
ANSWER: **Federalist** Party

7. The Generation of '27 was formed by writers in this language including the poet who wrote *Gypsy Ballads* and was killed during his country's civil war. The author of the play *Life Is a Dream* wrote in this language during his country's literary "Golden Age." The play *Blood Wedding* was written in this language. For 10 points, name this language used by Pedro Calderon (kal-der-OWN) de la Barca and Federico Garcia Lorca.
ANSWER: **Spanish**

8. In 2015, the IAU explicitly defined the parsec to be equal to 648,000 divided by pi of these units. This unit is approximately equal to 93 million miles. Approximately four of these units comprise the distance from Jupiter to Earth when they are closest to each other. Around 7 light-minutes comprise this unit, which is often defined as the mean distance from the Earth to the Sun. For 10 points, name this distance that is often abbreviated au (a-u).
ANSWER: **astronomical unit** [or **au** until it is read]

9. In 1998, this author agreed to purchase the Minnesota Vikings, but had to back out. The title of one of this author's novels refers to a nuclear submarine piloted by Marko Ramius, who intends to defect from the Soviet Union. After a terrorist attack kills the president in *Debt of Honor*, this author's recurring character Jack Ryan becomes president in his novel *Executive Orders*. For 10 points, name this novelist who wrote *The Sum of All Fears* and *The Hunt for Red October*.
ANSWER: Thomas "Tom" **Clancy** Jr.

10. This activity was mockingly engaged in by MMA fighter Michael Page after a July 2016 fight. Senators such as Al Franken have questioned Niantic over the amount of sensitive data collected as people perform this activity. The Holocaust Memorial Museum has requested visitors not engage in this activity, which has also led to people falling off rocks. For 10 points, in July 2016, over 21 million people used their mobile devices to play what game involving virtual creatures?
ANSWER: **Pokemon Go** [prompt on Pokemon; prompt on throwing Pokeballs]

11. A building in this city was designed by Rem Koolhaas (COOL-hoss) for a national TV company and has been compared to a giant pair of pants. A complex in this city said to have 9,999 rooms is now home to the Palace Museum, the most-visited museum in the world. Venues nicknamed "the Bird's Nest" and "Water Cube" were used during the 2008 Olympics in this city, whose main port is Tianjin. For 10 points, name this capital of China.
ANSWER: **Beijing** [or **Peking**]

12. W.V.O. Quine described a "veridical" type of these statements that are absurd, but nevertheless true. Bertrand Russell described one of them that arises from trying to formalize set theory. Several of these statements, including ones about an arrow in flight and Achilles and the tortoise, were devised by Zeno of Elea. The sentence "This statement is false" illustrates the liar's statement of this type. For 10 points, name these self-contradictory statements.
ANSWER: **paradox**es

13. In a work of fiction, the story of one of these animals is preceded by the story of a dog named Andrew Jackson who is beaten by a dog with no hind legs. After being filled with quail shot, one of these animals named Dan'l Webster loses a competition. For 10 points, name this type of animal, the subject of a Mark Twain story about a "celebrated jumping" one "of Calaveras County."
ANSWER: **frog**s

14. Each of these structures is uniquely characterized by the principal, azimuthal, and magnetic quantum numbers. Hund's rules states that, at each sublevel, all of these regions must be partially full before any can be completely full. Lanthanides contain the *f* type of these things, while lower energy ones are labeled *s*, *p*, and *d*. For 10 points, what set of regions around an atom is where electrons can be found?
ANSWER: atomic **orbital**s [or electron **orbital**s; or **AO**s]

15. Thomas Bowdler gives his name to a form of this practice that was first used for his book *The Family Shakespeare*. In *Near v. Minnesota*, it was ruled that a form of this act called prior restraint was unconstitutional. The so-called "Great Firewall" refers to a set of policies that institute this action across the Chinese Internet. For 10 points, name this act, in which the government or some other agency suppresses the media.
ANSWER: **censor**ship [prompt on expurgation or word forms; prompt on bowderlization; prompt on suppression of media]

 **VHSL Regular Season 2016-2017 - Round 10 - Tiebreaker Questions**

1. The Keweenaw Peninsula juts into this lake, through which most of the ore mined in the Mesabi Range is first transported. This lake, which contains Isle Royale National Park, was where an iron-transporting ship called the *Edmund Fitzgerald* sank in 1975. Duluth is a key port on this lake, which the Soo Locks connect to Lake Huron to its southeast. For 10 points, name this largest freshwater lake in the world and the northernmost of the Great Lakes.
ANSWER: Lake **Superior**

2. A feature of apoptosis (aa-pup-TOH-sis) is release of cytochrome (SY-toh-"chrome") c from this organelle. A pathway in this organelle converts oxaloacetate (ox-AL-oh-AH-suh-tate) into citrate (SIT-rate). A proton gradient is set up across this organelle's inner membrane cristae (KRIS-tay) to drive ATP synthase in the electron transport chain. For 10 points, name this "powerhouse of the cell" where the Krebs cycle occurs.
ANSWER: **mitochondria** [or **mitochondrion**]

3. These people suffered a rare loss at Ain Jalut (JAH-loot) near Nazareth. The northwest portion of their empire was founded by Batu, who ruled much of modern-day Russia. The term "kamikaze" (KOM-ah-KAH-zee) refers to the "divine wind" or typhoon that prevented these people from conquering Japan. When these people ruled China, they formed the Yuan Dynasty under Kublai. For 10 points, what people were led by Genghis Khan?
ANSWER: **Mongols** [or **Mongolians**; prompt on Golden Horde]

4. This author wrote about his experiences taking mescaline in his book *The Doors of Perception.* The protagonist of a novel by this man confronts the World Controller Mustapha Mond and whips Lenina Crowne before hanging himself in a lighthouse. For 10 points, name this British novelist who wrote about John the Savage in his dystopian novel *Brave New World.*
ANSWER: Aldous **Huxley**

5. Infamous criminal cases in this country included the trials of the Swiss born Oliver Fricker and the American Michael Fay, both of whom engaged in vandalism. Known as the "Red Dot" because of its size on the map, its founding father was Lee Kuan (KWON) Yew. The world's only island city-state, it requires some criminal offenders to receive six strokes from a cane. For 10 points, what island country was once part of its northern neighbor, Malaysia?
ANSWER: Republic of **Singapore**

Find the probability that when two fair six sided dice are rolled, both the sum and product of the results are even.
ANSWER: **1/4**

Of the five layers of Earth's atmosphere, which one stretches to about ten thousand kilometers, or six thousand miles, and lies above the thermosphere?
ANSWER: **exosphere**