**RTO 2016**

**Round 1**

Tossups:

1. **This novel is set between places called Pinchfield and Foxwood. One character in this novel is told that liberty is worth more than ribbons, and another character claims that it is Sunday seven days a week in (\*)**Sugarcandy Mountain. Its Seven Commandments are eventually shortened to a single rule. In this novel, a song, "Beasts of England" is taught by Old Major, and a group of characters adopts a Horn and Hoof Flag that has similarities to a hammer and sickle. FTP Name this allegory of the Russian Revolution featuring the pigs Napoleon and Snowball, written by George Orwell.

**Animal Farm**

1. **Malcolm Rifkind and Karel de Gucht were two people involved in "wargames" that simulated negotiations to prevent this event. John Bruton said that this event would be an** **"unfriendly act." It would involve invoking Article 50 (\*)** of theLisbon Treaty, similar to what Greenland did in 1985. David Cameron and the Conservatives promised to negotiate before allowing this event. This event, which the Obama administration is opposed to, was referred to in the Queen's Speech in 2015. In February, many Tory ministers came out in favor of this event, which could cause many voters to switch to the "Out" side. FTP, name this event in which a certain country would leave the European Union.

**Brexit** (accept anything relating to Britain or the UK leaving the European Union until mentioned)

1. **A graph with this number of vertices will have at least one monochromatic edge if it has 3 colors. According to Hacker's Jargon File, this number is the least random. This is the least number of clues needed to solve a (\*)** Sudoku puzzle. Gauss proved that a regular figure with this many sides can be constructed using a straightedge and compass. This number is the third Fermat prime and is the 7th prime. FTP, name this number which precedes 9 times 2.

**17**

1. **The way these devices function is related to Einstein's B-coefficient, and q-switching can be used to generate pulsed versions of these. These devices require a gain medium where there are more excited atoms than (\*)**unexcited atoms, called population inversion. China recently revealed the most powerful weapon involving one of these devices; it can destroy targets at long range in seconds. Thomas Maiman created the first ones of these devices using a ruby crystal in 1960. FTP, name this device that produces a beam of light of a single wavelength that people like to point at airplanes.

**Lasers** (accept **L4z0rs** from Kevin)

1. **This function has a fixed point known as the Dottie number. The inverse of this function has a range of 0 to pi, and its hyperbolic variant is equal to e to the x plus (\*)**e to the negative x all divided by 2. It is used in dot products and has a Taylor series that begins with 1 minus x squared over 2 factorial. The law of this function, when the angle measure is π/2 (pi over 2) radians, generates the Pythagorean Theorem. FTP name this trigonometric function which, for angles less than 90 degrees, is equal to adjacent over hypotenuse.

**Cosine**

1. **This painting has a face inside a yellow church. There is a faint line in between the pupils of the central figures. This painting features the Tree of Life (\*)** being held in the foreground. A man wears an elaborate red hat and a cross on his necklace confirming that he is Christian. Near the church, there are various houses as well as a man with a scythe and an upside-down violinist. There is a woman milking a goat on the cheek of another goat. This painting is based on the memories of its painter's hometown, Vitebsk. FTP, name this work depicting a goat facing a green-faced man, painted by Marc Chagall.

**I and the Village**

1. **This poet wrote of "delicate acrobats in the softest and most profound surface" in his poem "Fleas Interest Me So Much." He described his feet as "firemen unworthy of that woven fire of those glorious socks" in “Ode to My Socks”. In addition to writing (\*)** ”United Fruit Company”, he wrote that "Love is so short, forgetting is so long" and "I want to do to you what spring does with the cherry trees" in his most famous poem which begins with "tonight I can write the saddest lines." FTP, name this poet of "The Heights of Macchu Picchu" and "Twenty Love Poems and a Song of Despair."

Pablo **Neruda** or Ricardo Eliécer Neftalí Reyes **Basoalto**

1. **One wrote under the pseudonym "Arthur Francis" when working on *Two Little Girls in Blue*. They collaborated for the first time on *A Dangerous Maid.*Famous songs by them include (\*)** "I Got Rhythm" and "Fascinating Rhythm" but they famously worked on an opera in which a disabled beggar follows his beloved on a goat cart. That work features the song "Summertime" and is based on a DuBose Heyward novel. *An American in Paris* was written while one of these brothers studied with Nadia Boulanger. FTP, name these brothers who worked together on *Porgy and Bess.*Ira was a lyricist while George was a composer who wrote *Rhapsody in Blue.*

**Gershwin** brothers (George and Ira Gershwin)

1. **This man became mayor of Chongqing after its seizure from the Kuomintang, and shared power with the Eight Elders. He described Mao's rule as "7 parts good, 3 parts bad. Glass bottles, a pun on his name,(\*)**were smashed at protests that also saw the building of a statue of the "Goddess of Democracy". FTP, name this man who facilitated the opening of China and was in power during the Tiananmen Square Protests.

**Deng Xiaoping**

1. **This country's system of Golden Liberty allowed monarchs to be elected by a parliament. This country was pillaged by Sweden during the Deluge. A post-Jagiellonian king of this nation allied with Leopold I to break the 1683 siege of Vienna (\*).** It established a monarchical union at Lublin. This country's three neighbors partitioned it out of existence by the 1790s. Its nobles joined a parliament called the Sejm ("SEY-m"), where every member had a right to individually veto legislation. For 10 points, name this state which has had capitals in Warsaw, Krakow, and even both at the same time.

**Poland** (accept **Polish-Lithuanian Commonwealth**)

1. **This element, at above eight hundred degrees Celsius serves as the primary coolant in nuclear reactors, and its deuteride compound forms the fusion fuel in a Teller-Ulam bomb. This element is the main catalyst in synthetic (\*)**rubber manufacturing, and it is the only element within its group that can form a salt with gaseous nitrogen. Tritium is produced by bombarding this element's second most abundant isotope with neutrons, and three-volt batteries typically use this metal as the anode. FTP name this alkali metal with atomic number 3.

**Lithium** (accept **Li**)

1. **The man that discovered this planet also predicted the spiral pattern of the milky-way galaxy. It is predicted that the pressure and high concentration of methane in the atmosphere allows it to rain (\*)**diamonds. It has 13 rings and 27 moons. Its moons are named for characters in Shakespeare's plays. The largest moon, Titania, has only half the radius of the earth's moon. It, along with Neptune, is classified as an ice-giant. FTP, name this planet that has its axis of rotation tilted 98 degrees, and is the 7th from the Sun.

**Uranus**

1. **This quantity's SI unit is found using the von Klitzing constant of the quantum Hall effect. In high-frequency AC circuits, this quantity is increased via the skin effect. One manifestation of this quantity is the energy difference between the HOMO and LUMO states in a molecule, and is called the band gap, while its dependence on temperature is described by Matthiessen's Rule. Materials that have a value of zero for this quantity are subject to the Meissner effect, and are called (\*)** superconductors. The "sea of electrons" effect makes this low in metals, and in circuits, this quantity is additive for two of its namesake objects in series. Ohm's Law states that this quantity is equal to voltage divided by current. For 10 points, name this measurement of an opposition to current flow in a material.

Electrical **resistance**

1. **This holiday is not related to the Greeks’ worship of Cybele or the Romans’ celebration of Hilaria despite having the same sentiment. In 1908, Anna Jarvis held a memorial in West Virginia which started it, the state which now holds an international shrine of this holiday. Though she was never married, she later founded the international association of this holiday which was very specific about the (\*)**grammar of possession. Though scorned by Congress, President Woodrow Wilson recognized it as a national holiday. Religiously this holiday was originally celebrated to commemorate the Virgin Mary. FTP, name this often-forgotten holiday, falling on the second Sunday in May, commemorating maternal figures across the world but more importantly in your own household.

**Mother’s Day** (do not accept “Mothering Sunday”)

1. **Every year, this company hosts an event called Future Decoded. This company came up with the Wingdings font in 1990. In the 1980s, this company came up with his first logo, nicknamed the (\*)** "Pac-Man Logo." This logo lasted until 2012. In 2013, this company bought Nokia. In 2015, this Seattle-headquartered company changed the name of its most popular web browser to Edge. For ten points, name this company with the web search engine Bing.

**Microsoft**

1. **All the gods use this daily, except Thor, who wades below in the Kormt and Ormt rivers instead. This is mentioned in both the *Poetic Edda*and *Prose Edda*alternately as Asbru, and it ends at Himinbjorg, or heaven. The same type of entity as Gjallarbru, this is said to be partially red because it is covered in fire so that the Frost Giants (\*)** can not get up to heaven. Some scholars have proposed that this represents the Milky Way, although it is called by another name that refers to a colorful meteorological phenomenon. It is said that the forces of Muspell will cause its destruction at Ragnarok by attempting to cross it, and its name has been translated to mean "shimmering path." FTP, name this construction from Norse mythology that is guarded by Heimdallr, a rainbow bridge that reaches from Midgard to Asgard.

**Bifrost** Bridge

1. **In this painting, an elephant stands next to a pink fountain on the left, while a flock of birds flies through a building right above it. A gigantic lyre and harp are visible on the right. Two ears with a knife in between them are above a (\*)** bird-headed demon eating a human being. In the center panel, people are circling around a center pond on a variety of mounts, while on the left God is teaching Adam and Eve. FTP, identify this triptych representing heaven, Earth, and hell by Hieronymus Bosch.

**The Garden of Earthly Delights**

1. **An equation similar to this one was derived using transition state theory and is known as the Eyring equation. This equation becomes invalid at the glass transition temperature because the structural units slow down faster than this equation predicts. A constant in this equation (\*)** is known as the pre-exponential factor and is known as the frequency factor for first order reactions. FTP, name this equation that relates temperature to the rate of a reaction.

**Arrhenius equation**

1. **Amope wants to get money for the velvet cape she sold to the titular character in this author's *The Trials of Brother Jero*. Body parts are wagered in this man's play Madmen and Specialists, while in another play by this author village girls perform the Dance of the Lost traveller about the arrival of a photographer; an argument erupts between (\*)** Baruko and Lakunle, who are both trying to impress Sidi. In this author's most famous work, Samuel Pilkings interferes in a suicide being performed by Elesin, which is carried out in his place by Olunde. FTP, name this author of The Lion and the Jewel and Death and the King's Horseman, from Nigeria.

Akinwande Oluwole "Wole" Babatunde **Soyinka** (SHOY-inka)

**20 . This country's national holiday is on January 26th. This country has the world's lowest meat consumption per capita. It is home to the first international airport fully run by (\*)** solar power. Mihir Sen was the first person from this country to swim the English Channel. Bihar is a state in this country which has the third largest population. This country is home to the world's largest democracy. This country was home to people such as Jawaharlal Nehru and Gandhi. It is also home to the Taj Mahal. FTP name this country which has capital at New Delhi.

**India** (Accept Commonwealth of India)

**21. Many of this man's works were influenced by the landscape of the Eielson Air Force Base, where he served as a medical records technician. He was forced to cut short his most famous show after he was diagnosed with lymphoma and died on July 4, 1995. On October 29th of 2015, Twitch.tv launched (\*)**Twitch Creative with a marathon of The Joy of Painting, hosted by this man. FTP, name this painter known for his distinctive afro, "beat the devil out of it", and "happy little trees".

**Bob Ross**

**Toss-ups Round One**

1. FTPE, name these western philosophers
   1. This man’s famous statement, “I think therefore I am,” was first made in his Discourse on Method and sought to establish that the mind the existence of thought meant that the mind must at least exist.

René **Descartes**

* 1. This Englishman, sometimes considered the “wrecking ball” of philosophy, wrote about the nature of cause and effect in An Enquiry Concerning Human Understanding. He concluded that while we can observe effect, we cannot assume cause. He also wrote *A Treatise of Human Nature*.

David **Hume**

* 1. This man is best known for his work on the *Encyclopédie with*Jean le Rond d'Alembert, but he also wrote *Philosophical Thoughts and The Skeptic's Walk.*

Denis **Diderot**

1. FTPE, answer these questions about an area of the United States.
   1. This geographic feature borders three of the Great Lakes and contains the city of Marquette. While it contains 29% of its state's land mass, it has only 3% of the population, who are called Yoopers.

**Upper Peninsula** of **Michigan** (accept clear equivalents)

* 1. The Upper Peninsula borders these three Great Lakes.

Lake **Huron**, Lake **Superior**, and Lake **Michigan**

* 1. Lake Huron contains this largest freshwater lake island that is part of Ontario. It has many of its own lakes inside of it.

**Manitoulin**

1. For ten points each, answer these questions about cars and engines.
   1. This component in a car is part of the transmission, and deals with the connection of the engine to the drive wheels. Varieties of this part include automatic, manual, and semi-automatic or flappy paddle.

**gearbox**

* 1. This component is attached to the engine and uses the engine power to generate electricity.

**alternator**

* 1. This component rotates the axis of rotation of engine power by 90 degrees. Varieties of this component include open, manually locking, automatically locking, and limited slip.

**differential**

1. FTPE, answer these questions about a particular novel by Gabriel Garcia Marquez.
   1. This novel follows seven generations of a particular family in Macondo.

***One Hundred Years of Solitude*** or ***Cien Años de Soledad*** (do not accept A Hundred Years of Solitude)

* 1. Name that family. The founding patriarch is José Arcadio and his wife is Úrsula Iguarán.

**Buendía** family

* 1. The novel is written in this style, as is demonstrated by the fact that Remedios ascends into the sky while folding a white sheet and Aureliano III is born with a pig's tail and neither are viewed as strange ocurrences.

**magical realism** (do not prompt on **realism**)

1. This type of poem is often written in three lines, but was originally only written in a single column.
   1. FTPE, name this type of poem that consists of 17 syllables.

**Haiku**

* 1. This poet of the Edo period was renowned for his haiku and had several disciples. He went on several solitary wanderings around Japan after depressing events in his life.

Matsuo **Basho**

* 1. This most famous work by Basho takes the form of a travel diary as he described a foot journey that he made around Edo Japan. Many people still follow the path that he took today.

**The Narrow Road to the Deep North**or **The Narrow Road to the Interior** or **Oku no Hosomichi**

1. FTPE, answer these questions about the afterlife.
   1. In this religion, mankind will be judged as belonging either to Jannah or Jahannam on the day of judgement, known as Yawm al-Qiyamah.

**Islam**

* 1. This religion's version of the afterlife involves everyone evil staying in hell until eventually they are saved by Ahura Mazda.

**Zoroastrianism**

* 1. In this Christian concept, souls destined for heaven are in this place where sins are removed. The punishment is painful but is only temporary.

**Purgatory**

1. FTPE answer the following about Picasso paintings
   1. This painting was inspired by the bombing of a Spanish town. A light bulb is visible at the top and many dying people and animals are visible, as well as a flower sprouting from a broken sword.

**Guernica**

* 1. In another of Picasso's works during his blue period a man in a ripped shirt is bent over this object, the titular object of a painting housed at the art institute of Chicago

**guitar** (accept ***The Old Guitarist***)

* 1. This painting depicts five naked women posing, with a bowl of fruit in the foreground. Two of them have African masks

***Les Demoiselles d'Avignon (accept The Young Ladies of Avignon)***

1. FTPE answer some questions about berries.
   1. According to Chinese myth, a man who ate these berries daily lived to 256 years old. However there is no science to support its "fountain-of-youth" properties.

**Goji**Berry (Accept **Wolfberry**)

* 1. This indigo colored berry's scientific name is *Vaccinium corymbosum*and are native in only eastern and north-central North America. Maine is the largest producer of this berry in the U.S.

**Blueberry**

* 1. This plant has black berries on it, and is extremely toxic. According to legend, Macbeth’s soldiers poisoned the invading Danes with wine made from it.

**Deadly Nightshade**

1. FTPE: Answer these questions about a Herman Melville short story.
   1. This Herman Melville story is about an enigmatic character who works with Turkey and Nippers.

**Bartleby the Scrivener**

* 1. Bartleby was once rumored to work at this workplace.

**Dead-letter office**

* 1. Bartleby starves to death even though the narrator bribed a prison officer at this detention center.

**The Tomb**

1. FTPE, answer these questions about a former French and British colony.
   1. This island nation is in the Lesser Antilles between Trinidad and Tobago and St. Vincent and the Grenadines. Its capital is St. George's.

**Grenada**

* 1. Grenada is in this body of water that also contains the Lesser and Greater Antilles.

**Caribbean** Sea

* 1. The closest non-island country to Grenada is this country with capital at Caracas.

**Venezuela**

1. Combining certain sulfonic acids with sodium hydroxide yields phenol. FTPE
   1. Phenol is an example of this class of molecules which contain one or more hydroxyl group. Other examples include methanol and ethanol

**Alcohols**

* 1. Phenol is a derivative of this compound, the simplest aromatic hydrocarbon, which has formula C6H6.

**Benzene**

* 1. This simplest polycyclic aromatic hydrocarbon consists of two fused rings of benzene and is derived from coal tar.

**Naphthalene**

1. FTPE Answer the following about Noble Gases
   1. Name the six naturally occurring noble gases.

**Helium (He)**, **Neon (Ne)**, **Argon (Ar)**, **Krypton (Kr)**, **Xenon (Xe),** and **Radon (Rn)**

* 1. The first discovered binary compound of a noble gas, xenon tetrafluoride, has this molecular geometry that has four ninety degree bond angles.

**Square Planar**

* 1. Name this element used in MRI Scanners to cool the superconducting magnets.

**Helium** **(He)**

1. For 10 points each, name these famous keyboards.
   1. This keyboard, produced by the company that puts out iPhones and Macbooks, among other products, connects solely via Bluetooth and is often used with iPads.

**Apple Wireless Keyboard**

* 1. This classic keyboard, originally made by IBM and currently made by Unicomp, features buckling-spring style switches which are known for their characteristic loud noise. This is not a capacitive keyboard.

**Model M**

* 1. This first commercially produced typewriter was famously used by Friedrich Nietzsche, who wrote a poem about it. Its design allowed the user to type significantly faster than was possible on most early typewriters.

**Hansen Writing Ball**

1. FTPE, name these 2016 Republican Secret Service code names.
   1. This code name proposed by Jeb Bush was followed by an awkward high-five from Donald Trump. It is also the name of a flashlight and battery company.

**Eveready**

* 1. This name was ironically chosen by the leader of the polls as of the debate. It comes from the Latin root for "ground."

**Humble**

* 1. "Gator" was chosen by this candidate who gave the Republican Response to Obama's 2013 State of the Union Address.

Marco **Rubio**

1. FTPE, name these famous mathematicians
   1. This Swiss man's namesake identity is considered one of the most beautiful mathematical statements since it connects several important constants

Leonard **Euler**

* 1. When this man was 8, he learned how to quickly add up the first 100 natural numbers. His eponymous elimination is a way to solve systems of linear equations.

Carl Friedrich **Gauss**

* 1. This Indian mathematician is known for his work on number theory and continued fractions and whose namesake number is 1729.

Srinivasa **Ramanujan**

1. FTPE name these parts of a flower.
   1. This part of the flower is the female part. It contains the style and stigma.

**Pistil**

* 1. This part of the flower is the male part and contains the anther and the filament.

**Stamen**

* 1. This part of the flower attracts pollinators.

**Petal**

1. FTPE, answer these questions about a famous ballet.
   1. This opera features the Cowgirl trying to get the attention of the Head Wrangler. It features sections such as Corral Nocturne and Ranch House Party and ends with a piece based off of the folk tune, "Bonaparte's Retreat."

**Rodeo**

* 1. This composer of Appalachian Spring and Fanfare for the Common Man wrote Rodeo.

Aaron **Copland**

* 1. This other ballet by Copland starts with the title character stabbing a man who killed his mother before running away. It begins with the song "The Open Prairie."

**Billy the Kid**

1. This central force is the weakest of the four fundamental forces, and its gauge boson hasn't been discovered. For 10 points each:
   1. Name this force which attracts all masses in the universe, and keeps you connected to the ground.

**Gravity**

* 1. The magnitude of gravity varies with this power of the distance between the two objects. Electrostatic forces also have a magnitude related to this power of the radius.

**-2** (negative two)

* 1. This quantity equals the square root of 2 times the gravitational constant times the mass of a planet over the radius of the planet.

**Escape Velocity**

1. FTPE, answer these questions about a particular type of Buddhism.
   1. This school of Mahayana Buddhism emphasizes meditations and inner thought and de-emphasizes rote memorization.

**Zen**Buddhism

* 1. Involved in Zen Buddhism are these sayings that intend to provoke thought and demonstrate the master's insights. One example of these is "what is the sound of one hand clapping?"

**Koan**

* 1. This collection contains 48 koans, gathered by Wumen Huikai during the Song dynasty. It is one of the two major collections along with the Blue Cliff Record, and its name is a contradition

*The****Gateless Gate*** or *The* ***Gateless Barrier***

1. This word is pretty fun to say. FTPE,
   1. Name this word that describes a good that is capable of mutual substitution. Examples include sweet crude oil, bonds, precious metals, and currency. Diamonds may not have this quality because it varies with the type of cut.

**fungible** (or fungibility)

* 1. This type of currency is fungible and marketable. They are produced to provide a good or service to satisfy wants or needs.

**Commodity**

* 1. This entertainment commodity series was originally released in 1995 in its first edition. When Sony released it, its 32-bit processor was the best on the market.

**PlayStation** (accept PS)

1. FTPE name these paintings done by American painters.
   1. This painting shows a man with a pitchfork and a woman with a house in the background. Name this painting by Grant Wood.

**American Gothic**

* 1. This painting shows an elderly woman facing left and sitting in a chair with a handkerchief in hand. Her feet are on a mat and there is a picture clearly visible.

**Arrangement in Grey and Black, No. 1** (Also accept **Whistler's Mother)**

* 1. The only woman in this painting is looking away in horror. This painting depicts a femur surgery at Jefferson Medical College.

**The Gross Clinic**