

IMSANITY

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Tossups

- (1) **In this novel, the protagonist and narrator, who is never given a name, suffers from insomnia due to frequent business trips. The author was inspired to write it after he was involved in a camping altercation. One character manufactures soap from human fat and blows up buildings containing credit card records as part of** * Project Mayhem. That character, Tyler Durden, is ultimately revealed to be an alter ego of the narrator. Edward Norton and Brad Pitt starred in the film version of, FTP, this Chuck Palahniuk novel about a secret combat society whose first and second rules state that “you don’t talk about” it.

ANSWER: Fight Club

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- (2) **One experiment by this psychologist demonstrated that people are more willing to forward mail to medical research centers than the Communist or Nazi parties, while another controversial experiment concluded that people were remarkably effective in forwarding mail to a Bostonian stockbroker. In addition to his** * Lost Letter Experiment and his development of the concept of “six degrees of separation” through his Small World Experiment, this Yale psychologist had his ethics questioned in the wake of an experiment inspired by the Adolf Eichmann trial. FTP, name this psychologist who had subjects believe they were administering dangerous electrical shocks on command in his namesake Experiment on Obedience.

ANSWER: Stanley Milgram

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- (3) **The “twisted” this is a 3-dimensional parametric curve. Casus irreducibilis refers to the situation when the roots of a polynomial of this type are all real but require the use of complex numbers to solve for. Their roots can be found with** * Cardano’s formula, but the fact that the roots tend to not be constructible renders unsolvable two of the three problems of ancient Greek geometry, including trisecting an angle. Polynomials of this type have exactly one inflection point and have no maximum or minimum. FTP, give this adjective describing things with degree 3.

ANSWER: cubic (prompt on “degree 3” before the giveaway)

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- (4) In one of this artist's works, a lone lamppost lights the front of a dimly lit house, which stands in front of a small pond. In addition to the *Empire of Lights*, he depicted a silver tuba in flames in *The Discovery of Fire*. He depicted many men * raining in *Golconde*, and depicted a train emerging from a fireplace in *Time Transfixed*. His *Son of Man* features a man in a bowler hat with an apple obscuring his face. FTP, name this artist whose *The Treachery of Images* made the contradictory statement "This is not a pipe".

ANSWER: Rene Magritte

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- (5) Emilio Aguinaldo returned from exile during this conflict to lead a rebellion. A fleet was attacked and destroyed at Manila Bay, leading to the capture of the Philippines. Heavy resistance from the town of El Caney delayed reinforcements from reaching a crucial battle in which, en route to victory, Kettle Hill was captured in a charge led by the * Rough Riders at the Battle of San Juan Hill. It was called "a splendid little war" by John Hay, and William Randolph Hearst promised to "furnish the war" through tactics like exaggerated stories of the sinking of the USS Maine. FTP, name this conflict in which the United States acquired the Philippines, Puerto Rico, and Guam from the Spanish empire.

ANSWER: Spanish-American War

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- (6) At constant temperature, taking the partial derivative of this quantity with respect to pressure gives volume. Along a coexistence curve of a state diagram, this quantity is constant. It is used for isobaric and isothermal processes, and is equal to the negative product of the number of moles, * Faraday's constant, and the electrode potential. The Nernst equation is derived by using that relation and the Van't Hoff equation, which relates this quantity to the logarithm of the equilibrium constant. FTP, name this thermodynamic state function which determines the spontaneity of a reaction, symbolized G.

ANSWER: Gibbs free energy

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- (7) **In this work, a young girl makes herself a headdress out of seaweed, which makes her look like a mermaid. In another scene, a character notes that that girl should be named Coral or Ruby. That girl notices that the sunlight does not touch her mother because she has * sinned.** She then meets her father for the first time, and her parents agree to leave Puritan Boston and go to Europe. However, before this can happen, her father dies after giving his Election Day sermon. Featuring the Reverend Arthur Dimmesdale, FTP, name this novel about the adultress Hester Prynne, written by Nathaniel Hawthorne.

ANSWER: The Scarlet Letter

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- (8) **Marian Smoluchowski developed a one-dimensional model that described a particle undergoing this process. Often modeled as a Wiener Process, an equation developed by Pierre Langevin computes the average displacement of particles undergoing this process. More famously, * Einstein predicted that a diffusion coefficient proportional to temperature characterized these random movements, first observed when its eponymous scientist observed pollen particles jiggling in a tube of water. Also called pedesis, FTP, name this seemingly-random movement of particles in a fluid.**

ANSWER: Brownian motion (accept “pedesis” before it is read)

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- (9) **One character in this work claims that another character’s face looks like a map of the Indies. Earlier, she claims that this character, a steward, is Puritan, though not a very good one. She then comes up with a plan in which the steward wears crossed * garters and yellow stockings. He decides to wear these after reading a forged letter, while Fabian and two drunken knights laugh at him from behind a bush. Meanwhile, Olivia woos a Cesario, not realizing that he is really a woman. FTP, name this Shakespeare play in which Viola marries the Duke Orsino.**

ANSWER: Twelfth Night

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- (10) **To manage the intentions of subprocesses, Dekker’s Algorithm for mutual exclusion uses this command, first introduced in the ALGOL language. Its indefinite termination can be used to create an * infinite program, as when its test condition is set to “true”. This can be made into a pre-test structure by combining it with “do”, and in Perl it can be replaced with “until”. A conditional control structure that executes a block of code as long as its test condition holds, FTP, identify this loop, a complement to “for”.**

ANSWER: while loop

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- (11) **This man recorded philosophical discussions regarding education conducted with his son Adeodatus in his *Concerning the Teacher*. This man strayed from his belief in Manichaeism after one of its priests, Faustus of Mileve, was unable to give satisfying answers to his questions. He devoted himself to priesthood after reading a biography on Saint Anthony of the Desert. After the * 410 Sack of Rome, this man wrote a book reminding Christians that their empire was in Heaven, *The City of God*. In his most famous work, he describes his conversion from a life of sin to Christianity. FTP, name this Roman-African theologian, the author of the autobiographical *Confessions*.**

ANSWER: St. Augustine of Hippo (or Aurelius Augustinus)

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- (12) **The author dedicates this book to Leon Werth, but after some discussion, changes his dedication to “Leon Werth when he was a little boy”. During the titular character’s travels, he is called a subject, an admirer, and an explorer, and after each encounter remarks that * “Grown-ups are very strange”. After these travels, he comes to Earth where he encounters a deadly snake and a fox that he tames before asking the narrator, an aviator whose plane has crashed in the Sahara, to draw him a sheep. FTP, name this children’s book by Antoine St. Exupéry.**

ANSWER: The Little Prince or Le Petit Prince

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- (13) **Most of the German army dissolved after the original leader of this expedition, Frederick Barbarossa, drowned in the Saleph river. Partially prompted by an embarrassing defeat at the Horns of Hattin, it featured a two-year long siege in which French and English forces ultimately captured * Acre.** Arguments between King Philip V and the other leader of this campaign led to the French forces returning home. The Battle of Arsuf saw Saladin lose at the hands of King Richard the Lionheart, but during his return home Richard was captured and ransomed by Leopold of Austria. FTP, name this 1189 to 1192 conflict in which German, English, and French crusaders failed to capture Jerusalem and the Holy Land.

ANSWER: Third Crusade

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- (14) **A crowd of children mocks the arrival of Captain Zuniga and the guard in Act 1, where the soldiers gather to flirt with the worker girls at the cigarette factory. At the beginning of Act 3, two women read cards and prophesize great fortune in their futures, but the title figure only foresees death. The title figure seduces * Don José with a seguidilla after warning him that love is a “rebellious bird” in her “Habañera” aria, and the famed bullfighter Escamillo presents himself to her by singing his “Toreador Song”. Don José and Escamillo compete for the love of the title gypsy in, FTP, this opera by Georges Bizet.**

ANSWER: Carmen

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- (15) **The production of free electrons and positrons from the collision of atomic nuclei and gamma rays describes the “pair-instability” variety of this event, predicted by Gary Fraley in 1968. A widely-observed one was seen in 1054 AD, which left behind Messier object number 1, * the Crab Nebula.** These events are useful as standard candles, as the type Ia reaches an absolute magnitude of -19.3 with little variation. The type II of this event results from core collapse. FTP, name these stellar explosions which release massive amounts of energy.

ANSWER: supernovae (do not accept or prompt on “novae”)

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- (16) **This novel discusses the Cyprus Experiment and its conclusion that “the optimum population is modeled on the iceberg”. In one scene, a group participates in Orgy-Porgy at the Fordson Community Singery, and in another scene, one character reminds another that “A gramme is always better than a damn”. Those two characters, * Lenina and Bernard, travel to New Mexico, where they meet John. They bring him back to London, where he debates about humanity versus stability with Mustapha Mond before becoming disillusioned and hanging himself. Beginning in the year 632 After Ford, FTP, name this dystopian novel by Aldous Huxley.**

ANSWER: Brave New World

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- (17) **On the far left side of this painting, shoreside buildings can be seen, which gradually fade into hills on the edge of the horizon. A man in the lower right ignores the titular character while fishing in the water. In the lower left corner, the most prominent figure holds a plow pulled along by a horse. * The title figure only occupies a small portion of the painting, and his feet can be seen sticking out of the water. FTP, name this painting depicting the son of Daedulus who fell to earth when his wax wings melted, a work by Peter Bruegel the Elder.**

ANSWER: Landscape with the Fall of Icarus

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- (18) **Sir Charles Tupper held this title for the shortest amount of time at 69 days. Holders of this title can request a general election at any time within a 5-year span, which has led to terms of less than six months for the likes of John Turner and Kim Campbell. This title was held on three non-consecutive occasions by William Lyon Mackenzie King. This person need not be a member of the House of Commons, demonstrated by * Senators John Abbott and Mackenzie Bowell, but this person must be able to direct it. Inheriting its mandate from Britain’s position of the same name, FTP, Steven Harper currently holds this title of a North American head of government.**

ANSWER: Prime Minister of Canada

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- (19) This is the smallest number of people needed to guarantee at least a 50 percent chance that some two will share the same birthday. At the 1900 International Congress of Mathematicians, David Hilbert set forth this many problems as a challenge to twentieth century mathematics and Book I of *The Elements* begins with this many basic definitions, including “point” and “line”. Excluding the * initial arrangement, there are this many ways to reorder four books on a shelf. Itself a Germain prime, FTP, name this number which proves that 11 is a Germain prime on account of it exceeding the double of 11 by 1.

ANSWER: 23

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- (20) The Human Lymphotropic Virus is known to significantly increase one’s risk of developing a special type of this disease. There are four divisions of this disease, namely, the acute and chronic varieties of the lymphocytic and myelogenous types of it. This disease is usually diagnosed using repeated complete * blood counts and bone marrow examinations; treatment is non-standard and often palliative. In some varieties of the disease, such as the hairy cell one, treatment may not be given altogether until symptoms start to become unmanageable. FTP, name this disease often referred to as blood cancer.

ANSWER: Leukemia

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- (21) In the mythology of this religion, the moon god angered the sun goddess by killing the goddess of food, causing day and night to never coexist. Another story of this religion’s mythology tells of the storm god being banished from Heaven for killing his sister’s attendant by throwing a dead pony at her. In this religion, special offerings are made during the daily periods of ritual purification known as * harai, and the shrine aspect of this religion is known as Jinja. Centering on spirits called kami, FTP, name this religion with mythology featuring Izanagi and Amaterasu, the official religion of Japan.

ANSWER: Shintoism

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Bonuses

(1) It premiered in Cairo in 1871. FTPE:

[10] Name this opera in which Ramades is sentenced to death for being disloyal to the Pharaoh, upon which he titular princess sneaks into his cell to die in his arms.

ANSWER: Aida

[10] *Aida* was written by this Italian romantic composer whose operas include adaptations of Shakespeare's *Macbeth* and *Othello*.

ANSWER: Giuseppe Verdi

[10] Verdi included *Libiamo ne' lieti calici*, better known as *The Drinking Song*, in this opera about Violetta, the titular character.

ANSWER: La Traviata

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(2) Answer the following about a familiar algebraic structure FTPE:

[10] Coming from Greek for “many names”, this mathematical structure is formed as the sum of coefficients multiplied by nonnegative powers of a variable.

ANSWER: polynomial

[10] The number of roots of a nonzero polynomial is bounded above by this number, representing the largest exponent of the variable appearing with a nonzero coefficient.

ANSWER: degree

[10] This word describes a number which is a root of some polynomial. It is the opposite of transcendental.

ANSWER: algebraic

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(3) The title character recites a section of the poem “Ossian” for Charlotte the last time he visited her. FTPE:

[10] The title character makes friends with Fräulein von B. [FROI-line fawn BAY] after leaving Wahlheim [VAHL-hime] and later commits suicide after asking Albert for two pistols in which epistolary novel?

ANSWER: The Sorrows of Young Werther

[10] This proponent of the Sturm und Drang movement in German literature wrote *Faust* in addition to *The Sorrows of Young Werther*.

ANSWER: Johann Wolfgang von Goethe

[10] This Goethe work, which has been famously been made into a musical work by Franz Schubert, ends with the father realizing that his son is dead upon running towards the Hof.

ANSWER: “Der Erlkönig” [or “The Alder King” or “Erlking”]

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(4) Answer the following about Australian capitals FTPE:

[10] This state completely surrounds the Australian Capital Territory, the home to the national capital of Canberra. It was the first British colony on the Australian mainland.

ANSWER: New South Wales

[10] This most populous city in Australia is the capital of New South Wales as well as the home to Harbour Bridge and a distinctive opera house.

ANSWER: Sydney

[10] This capital of the Northern Territory was named by the captain of the HMS Beagle, who visited the region in 1839.

ANSWER: Darwin

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(5) During it, it is said that there will be incessant wars in which brothers will kill brothers. FTPE:

[10] Name this period of three consecutive winters in Norse mythology in which snow will fall incessantly.

ANSWER: Fimbulwinter or Fimbulvetr or Fimbulvinter

[10] Fimbulwinter precedes this final battle in Norse mythology, which will oversee the world being destroyed only to be created anew.

ANSWER: Ragnarok

[10] During Ragnarok, the sky will split in two and Surtr, the ruler of this flaming world, will ride into the earth and kill Freyr.

ANSWER: Muspelheimr or Muspell

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(6) To solve for this value, one usually takes the negative logarithm of the concentration of hydrogen ions in a solution. FTPE:

[10] Identify this measure of the acidity of a solution:

ANSWER: pH

[10] This acid-base theory states that acids donate protons while bases gain the corresponding hydrogen ion.

ANSWER: Bronsted-Lowry theory

[10] Molecules exhibiting this property can donate protons as well as accept them according to Bronsted-Lowry theory. A common example is water.

ANSWER: amphotericism or amphiproticism

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(7) Answer the following questions about Tom Sawyer FTPE:

[10] *The Adventures of Tom Sawyer* was written by this author of *A Connecticut Yankee in King Arthur's Court*.

ANSWER: Mark Twain or Samuel Langhorne Clemens

[10] At the beginning of *The Adventures of Tom Sawyer*, Aunt Polly punishes Tom for playing hooky with what chore?

ANSWER: whitewashing the fence or painting the fence (accept clear-knowledge equivalents)

[10] Tom Sawyer appears in several other Twain books by, including *The Adventures of Huckleberry Finn* and this one in which he and Huck travel to Africa in a hot air balloon.

ANSWER: Tom Sawyer Abroad

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(8) Answer the following about a Southeast Asian nation FTPE:

[10] This country with capital at Phnom Penh traces its roots to the ancient Khmer Empire that built Angkor Wat.

ANSWER: Cambodia

[10] This Communist ruling party of Cambodia from 1975 to 1979 killed approximately one-fourth of its population through purges and executions. It was named after the scarves its members wore.

ANSWER: Khmer Rouge

[10] This leader of the Khmer Rouge intended to create a self-sufficient agrarian utopia. He died in 1998 while under house arrest.

ANSWER: Pol Pot or Saloth Sar

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(9) This building rests on Ludgate hill, the highest point in the city. FTPE:

[10] Name this building in London whose dome holds the "Whispering Gallery". It was badly damaged by the 1666 Great Fire in London.

ANSWER: St. Paul's Cathedral

[10] This architect, who designed St. Paul's Cathedral after the fire, also was responsible for over fifty other London churches. He also designed the library of Trinity College.

ANSWER: Sir Christopher Wren

[10] Wren also designed this building, which served as a center for studying astronomy and navigation. However, the scientific work has been relocated and it now serves as a tourist attraction, notably marking the location of the prime meridian.

ANSWER: Royal Observatory, Greenwich or Greenwich Observatory

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(10) It declared “Out of the darkness, I came the farthest...Learn from these streets, it can be bleak, Accept no defeat, surrender, retreat”. FTPE:

[10] Name this song by Somali-Canadian artist K’naan which stated “when I get older, then I’ll be stronger, they’ll call me freedom, just like” this titular object.

ANSWER: Wavin’ Flag

[10] “Wavin’ Flag” was used by Coca-Cola for endorsements during this 2010 sporting event hosted by South Africa and won by Spain.

ANSWER: FIFA World Cup

[10] A version of “Wavin’ Flag” was recorded by a charitable group of Canadian artists called Young Artists for this nation, which experienced a magnitude 7.1 earthquake in January 2010.

ANSWER: Haiti

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(11) It occurs at the TATA box. FTPE:

[10] Name this process that uses DNA as a template strand to create messenger RNA in gene expression.

ANSWER: transcription (also accept RNA Synthesis)

[10] Give the name for this family of enzymes which, “read” an intact DNA strand and use it as a template to synthesize the new strand.

ANSWER: DNA Polymerases

[10] These RNA protein complexes exist in the nucleus of eukaryotic cells, combining with unmodified mRNA. They are important in gene regulation because of the removal of introns.

ANSWER: snRNPs (pronounced “snurps”) or small nuclear ribonucleoproteins

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(12) Answer the following questions about a play FTPE:

[10] In this play, the Cockney Eliza Doolittle is taught by Henry Higgins to speak properly. It was adapted into the musical *My Fair Lady*.

ANSWER: Pygmalion

[10] This Irish playwright wrote *Pygmalion*, for which he received both a Nobel Prize for Literature and an Oscar.

ANSWER: George Bernard Shaw

[10] This gentleman is a friend Henry Higgins and is also interested in phonetics. Eliza attempts to sell him flowers at the start of the play.

ANSWER: Colonel Pickering

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(13) There are many way to prove that there are infinitely many prime numbers. FTPE:

[10] The first known proof of the infinitude of primes was a proof by contradiction appearing in Book IX of *The Elements* by this ancient Greek geometer.

ANSWER: Euclid

[10] Another proof comes by noting that numbers of the form 1 plus 2 to the power of 2 to the n are pair wise coprime. Numbers of the given form are now named after this 17th century French number theorist, who conjectured that they were all prime.

ANSWER: Fermat

[10] Yet another proof demonstrates that the product over all primes p of 1 over the quantity 1 minus 1 divided by p close quantity is equal to this divergent series, which is the sum of 1 over n as n goes from 1 to ∞ .

ANSWER: harmonic series

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(14) He was sentenced to 150 years in prison in June 2009 for “one big lie”. FTPE:

[10] Name this American investment manager and stock broker who admitted in December 2008 to securities fraud which had cost his investors a reported \$65 billion.

ANSWER: Bernard Lawrence “Bernie” Madoff

[10] Madoff ran this type of fraud, in which returns are paid out of the investments of more recent clients.

ANSWER: Ponzi scheme

[10] Madoff had been a chairman at this stock exchange.

ANSWER: NASDAQ

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(15) Carl Anderson first postulated the existence of these particles, and they can be generated by pair production. FTPE:

[10] Name this antimatter counterpart of the electron.

ANSWER: positron or antielectron

[10] For a positron, this property is equal to $1/2$ or negative $1/2$. This quantum number is also known as intrinsic angular momentum.

ANSWER: spin (prompt on “s”)

[10] In this doubly-eponymous experiment, a beam of silver atoms was shot through an inhomogeneous magnetic field. The pattern of deflection proved that spin was quantized.

ANSWER: Stern-Gerlach experiment

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(16) The main entrance is I.M Pei's Glass Pyramid. FTPE:

[10] Name this most visited museum of art, located on the right bank of the Seine in Paris.

ANSWER: Louvre or Musee de Louvre (accept equivalents)

[10] The Daru staircase in the Louvre leads to this Roman statue. While it is missing its head and arms, its wings remain intact, and it was created to honor a sea battle as well as honor the namesake goddess.

ANSWER: Nike of Samothrace OR Winged Victory of Samothrace

[10] This French painter depicted a reclining nude woman in his *La Grande Odalisque*, which resides in the Louvre. He also depicted a poet reaching divinity in *The Apotheosis of Homer*.

ANSWER: Jean Auguste Dominique Ingres

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(17) Answer the following about a certain revolutionary FTPE:

[10] This Commander-in-Chief of the Revolutionary Army led the Americans at the battles of Monmouth and Yorktown before serving as the first President of the Unites States.

ANSWER: George Washington

[10] This general took credit for Benedict Arnold's actions at Saratoga, but was embarrassed with his defeat at the Battle of Camden. He repeatedly asked Congress to replace Washington with him as Commander-in-Chief.

ANSWER: Horatio Gates

[10] This plot was named after an Irishman whom Washington refused to promote. Members such as Thomas Miffin and Benjamin Rush exchanged letters about replacing Washington with Gates. John Cadwalader finally shut the namesake general up by shooting him in the mouth in a 1778 duel.

ANSWER: Conway Cabal

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(18) The number π [pi] appears a lot in mathematics, even outside of geometry. FTPE:

[10] e raised to the pi times i power equals negative one according to a famous formula attributed to this Swiss mathematician.

ANSWER: Leonhard Euler

[10] This formula states that n factorial is approximately equal to the quantity n over e close quantity to to n th power times the square root of two pi n .

ANSWER: Stirling's Formula

[10] As determined by Euler, this is the value of the sum as n goes from one to infinity of one divided by n squared.

ANSWER: $\pi^2/6$ [pi squared over six]

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(19) Identify the following about rocks FTPE:

[10] Marble is of this type of rock that is formed from sedimentary and igneous rocks that have been changed through heat, pressure, strain, or fluids. Most of the rare minerals are also of this type of rock.

ANSWER: metamorphic

[10] This metamorphic rock originated from sandstone and can be used in road and railway construction. It was also used as a less effective alternative to flint during the Stone Age.

ANSWER: quartzite

[10] This property of metamorphic rocks can be classified on the Barrovian scale, which indicates the amount of pressure and heat that were involved in the process of the metamorphic rock formation.

ANSWER: grade

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(20) Connie Reid has an affair with Michaelis, and the nurse Mrs. Bolton helps Connie become more independent. FTPE:

[10] Name the novel in which Oliver Mellors sleeps with the title character on the forest floor.

ANSWER: Lady Chatterley's Lover

[10] This author of *Lady Chatterley's Lover* also wrote about Paul Morel in *Sons and Lovers*.

ANSWER: David Herbert Richards Lawrence

[10] This is the husband of Connie who is distanced from her after becoming paralyzed during World War I. He lives at his estate, Wragby.

ANSWER: Clifford Chatterley

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(21) It was written because of the poor reception of the author's early book, *A Treatise of Human Nature*, and awoke Immanuel Kant from his "dogmatic slumber." FTPE:

[10] Name this philosophical work which distinguishes between "matter of fact" and "relations of ideas," known as the author's namesake fork.

ANSWER: Enquiry Concerning Human Understanding

[10] This Scottish empiricist discussed the nature of God's existence in *Dialogues Concerning Natural Religion* and was the author of *Enquiry Concerning Human Understanding*.

ANSWER: David Hume

[10] In the tenth section of *Enquiry Concerning Human Understanding*, Hume claims that not enough evidence by honest and intelligent witnesses has been provided to support the supposed occurrences of these religious phenomena.

ANSWER: miracles

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