



1. One composer from this country paired off wind instruments playing parallel intervals in his *Concerto for Orchestra* and arranged 153 piano pieces in order of increasing difficulty in his *Mikrokosmos*. Another composer from this country included "Will o' the Wisp" and "Mazeppa" in his twelve *Transcendental Etudes* and incorporated gypsy folk melodies into a set of "rhapsodies" named for this country. For 10 points, name this home country of Bela Bartok and the piano virtuoso Franz Liszt.

ANSWER: **Hungary** [or **Magyarország**]

195-12-71-05101

2. One type of feature produced by these bodies comes in washboard, medial, and ground varieties. Depressions on these bodies give rise to features called kames, and they can form round valley heads called cirques. Elongated hills called moraines are formed by these bodies, which deposit sediment called till when they move. These bodies are divided into ablation zones and accumulation zones. For 10 points, name these massive bodies of perennial ice.

ANSWER: **glaciers**

014-12-71-05102

3. This statue was continuously wiped with olive oil to prevent cracking. When this statue was completed for a temple designed by Libo of Elis, a lightning bolt hit the temple but did no damage. Strabo criticized this statue as being too large, as its head nearly touched the roof even though the statue is seated. This was the largest statue made of chryselephantine, a material combining gold and ivory. It was designed by Phidias in order to oversee ancient athletic games. For 10 points, identify this ancient wonder of the world.

ANSWER: Statue of **Zeus** at Olympia

019-12-71-05103

4. While working with Josef Breuer, this psychologist examined the case study of Anna O., and he later treated a Russian known as the "Wolf Man." He theorized the self-destructive impulses of the "death drive" in contrast to those of the creative Eros in his essay *Beyond the Pleasure Principle*. His book *The Interpretation of Dreams* introduced the Oedipus complex as a source of psychosexual trauma. For 10 points, name this founder of psychoanalysis.

ANSWER: Sigmund **Freud**

014-12-71-05104

5. The speaker of one poem by this author claims that "like the cat I have nine times to die" and concludes by proclaiming "out of the ash I rise with my red hair and I eat men like air." The title figure of another poem by this author "bit my pretty red heart in two." This author of "Lady Lazarus" wrote a novel in which Dr. Nolan carries on psychotherapy sessions with a woman who works as an intern for the *Ladies' Day* magazine. For 10 points, name this author of "Daddy" and *The Bell Jar*.

ANSWER: Sylvia **Plath**

020-12-71-05105

6. The kinetic isotope effect involves calculating the difference in this property when an isotope is substituted on a reactant. Overall reaction order is determined by changing the concentration of the reactants and measuring the corresponding change in the initial value of this property. It roughly doubles for every ten degree Celsius increase in temperature, according to the Arrhenius equation, which measures its namesake constant. This property can be increased by stirring or adding a catalyst. For 10 points, name this property which measures how fast a reaction occurs.

ANSWER: reaction **rate**

190-12-71-05106

7. In this work, Antilochos is instructed to stay close to a stump when making his turn in a chariot race held in honor of the son of Menoitios. Sarpedon's lieutenant and the son of Tydeus exchange their armor in this work before the latter steals the Thracians' horses during a midnight raid. The death of Patroclus in this work forces the leader of the Myrmidons to put aside his quarrel with Agamemnon over Briseis, after which he slays Hector. For 10 points, name this Homeric epic recounting the rage of Achilles during the Trojan War.

ANSWER: the ***Iliad*** [or ***Ilias***]

195-12-71-05107

8. This locale features an area called the Apes' Den, whose tailless Barbary Macaques are the only free living primates in Europe. Llanito is spoken in this area, which is accessed by land via La Linea de la Concepcion. Its best known features was called Mons Calpe by the Romans, and is located east of Cape Spartel. Algeciras is found at the west of its namesake gulf, while Ceuta lies on its namesake strait. For 10 points, name this British territory located at the southern tip of Iberia.

ANSWER: **Gibraltar**

192-12-71-05108

9. Disasters involving this body of water helped inspire the 1850's Nien Rebellion. This river's source is located in the Bayan Har mountains. This river forms three sides of the Ordos Loop. Its middle stream passes through the Loess Plateau. In 1938, Nationalist troops intentionally flooded this river to prevent foreign invaders from taking the city of Zhengzhou. Notable for the large amount of silt it carries, this river's constant natural flooding caused it to receive the name of "China's Sorrow." For 10 points, name this second-longest river in China.

ANSWER: **Yellow River** [or **Huang He**]

052-12-71-05109

10. One character on this show owns a stuffed hippo named Bert and enjoys a fictional energy drink called "Caf-Pow." A Hamas agent on this show, who smuggles himself into a morgue in a body bag and murders Kate Todd, is Ari Haswari. On this show, the ex-Mossad officer Ziva, the goth Abby, and the womanizing Tony are part of a team led by the Mark Harmon-played Gibbs. For 10 points, name this spinoff of *JAG* about a government agency that investigates navy-related crimes.

ANSWER: ***NCIS: Naval Criminal Investigative Service***

080-12-71-05110

11. This word can refer to the very top of a skull or tooth. It names a historically black neighborhood of Queens, New York, where Ella Fitzgerald, Dizzy Gillespie, and Louis Armstrong lived. It can also mean the layer of the sun where solar wind originates, which reaches a two million degree temperature despite being further away from the center of the sun than the chromosphere or photosphere. For 10 points, give this word, from the Latin for "crown," which denotes the solar layer visible during an eclipse.

ANSWER: "**corona**"

019-12-71-05111

12. One character in this play is thrown off by Rosalind's vow of celibacy. It begins with an argument between Samson and Gregory, which is broken up by Prince Escalus, who has a relative named Paris who wishes to wed one of the title characters. Act III of this play includes Tybalt's murder of a character who gives the Queen Mab speech, Mercutio. This play ends with the deaths of the title characters, who are members of the rival Montague and Capulet families. For 10 points, name this Shakespearean tragedy about a pair of "star-crossed lovers."

ANSWER: **Romeo and Juliet**

192-12-71-05112

13. Studies on Iowa prisoners and British conscientious objectors found that only 10 mg of this substance per day was needed to reverse the effects of its deficiency, which include brown spots on the skin and bleeding from mucous membranes. Three enzymes used in the synthesis of collagen use this compound as a co-factor. Linus Pauling controversially promoted the intake of this compound to combat cancer and the common cold. Also known as ascorbic acid, this water-soluble compound is deficient in scurvy. For 10 points, name this vitamin found abundantly in citrus fruits.

ANSWER: **vitamin C** [or L-**ascorbic acid** or **ascorbate** before mentioned; just **C** needed after "vitamin" is mentioned]

020-12-71-05113

14. Solving the characteristic polynomial finds the eigenvalues for one of these objects. The rank of these is found through Gaussian elimination, which can also be used to solve linear systems by putting one of these in row echelon form. Multiplication is not commutative for these objects, and inverses only exist for square ones. The inverse of one of these equals its adjugate divided by the determinant. For 10 points, name these arrays of numbers.

ANSWER: **matrices** [or **matrix**]

121-12-71-05114

15. While serving in the Senate, this politician led an early political machine called the Albany Regency. As Secretary of State, this politician rose in power during the Petticoat affair by treating Peggy Eaton with respect. This President sent out Winfield Scott to handle the Aroostook War, and his popularity was hurt by the Second Seminole War. Taking office after his predecessor's passage of the Specie Circular, this man was blamed for the Panic of 1837. For 10 points, name this successor of Andrew Jackson.

ANSWER: Martin **Van Buren**

014-12-71-05115



1A. What series of music video games featured players moving their feet to various points on a pad to match the movement of arrows in the game?

ANSWER: **Dance Dance Revolution** [or **DDR**]

1B. What nineteenth-century advocate of Irish Home Rule had a scandalous affair with Kitty O'Shea?

ANSWER: Charles Stewart **Parnell**

2A. The dentist Dr. Byron McKeeby holds a pitchfork in front a house in what Grant Wood painting?

ANSWER: **American Gothic**

2B. Suharto and Sukarno were two former leaders of what archipelagic nation that once controlled East Timor?

ANSWER: Republic of **Indonesia** [or Republik **Indonesia**]

3A. Galina Ulanova and Maris-Rudolf Liepa performed for what leading ballet company of Russia and the Soviet Union?

ANSWER: **Bolshoi** Ballet

3B. In 2013, this chancellor from the CDU party will face-off in an election against Peer Steinbrück of the SPD in Germany.

ANSWER: Angela **Merkel** [or Angela Dorothea **Kasner**]

4A. This is a 20-second calculation question. Convert the angle  $9\pi$  over 4 radians into degrees.

ANSWER: **405** degrees

4B. This is a 20-second calculation question. Find all real solutions to the equation  $x$  to the fourth power equals 16.

ANSWER: **2** and **-2** [or **plus and minus 2**]

5A. Name the writer who described Clyde Griffith's murder of Roberta Alden and Caroline Meeber's trip to Chicago in his novels *An American Tragedy* and *Sister Carrie*.

ANSWER: Theodore **Dreiser**

5B. Which antislavery perpetrator of the Pottawatomie Massacre was hung shortly after he was captured raiding Harpers Ferry in 1859?

ANSWER: John **Brown**

6A. What medieval conflict included major battles at Agincourt and Crecy, with major figures such as Henry V and Joan of Arc fighting?

ANSWER: **Hundred Years'** War

6B. What Greek letter denotes cells in the Islets of Langerhans that secrete glucagon, as well as a type of radioactive decay that releases a helium nucleus?

ANSWER: **alpha**

7A. Name this French artist of *The Yellow Christ* who spend much of his career in Tahiti.

ANSWER: Eugène Henri Paul **Gauguin**

7B. This is a 30-second calculation question. A 10-by-10 square has four triangles cut from its corners. Each triangle is an isosceles right triangle with leg length 2. What is the perimeter of the octagon that is formed?

ANSWER: **24 plus 8 root 2** [or **24 plus 8 radical 2**; or **24 plus 8** times the **square root of 2**]

8A. This is a 30-second calculation question. Find the number of two-element subsets of the set {1,2,3,4,5,6}.

ANSWER: **15**

8B. On Christmas Day in 1989, what dictator and his wife Elena were killed trying to escape from Bucharest?

ANSWER: Nicolae **Ceausescu**

9A. Which novel by Emily Bronte focuses on the tumultuous love between Catherine Earnshaw and Heathcliff?

ANSWER: **Wuthering Heights**

9B. What lake in Oregon sits inside the caldera of a collapsed volcano in the Cascades?

ANSWER: **Crater** Lake

10A. What British soccer player for Chelsea retired from international play in 2012 after being accused of calling Anton Ferdinand racist names?

ANSWER: John George **Terry**

10B. What Argentinian writer described a place where every point in the universe can be seen in "The Aleph" and wrote about Dr. Yu Tsun in "The Garden of Forking Paths"?

ANSWER: Jorge Luis **Borges** (HOR-hay loo-EES BOR-hays)



1. This physicist is the namesake of a rotator used in amplifiers which uses his namesake effect, in which the plane of polarization for a light beam is rotated by a magnetic field. His namesake cage effectively blocks electromagnetic waves, and his namesake law relates induced voltage in a closed loop with the change in magnetic flux. For 10 points, identify this namesake of a law of induction in Maxwell's Equations, who is also the namesake of the SI unit for capacitance.

ANSWER: Michael **Faraday**

189-12-71-05117

2. In the *Iliad*, this god protects the corpse of Hector from being destroyed while its dragged around Troy's walls. After she refused his advances, this god cursed a woman to have the gift of prophecy but never be believed. He was born on a floating island after Hera prevented his mother from giving birth on any real land. He killed Python at a site where oracles would later communicate with him, Delphi. For 10 points, name this Greek god of music and brother of Artemis.

ANSWER: **Apollo**

121-12-71-05118

3. Participants in this event briefly allied with the Occaneechi tribe prior to betraying them. John Ingram led this rebellion after its original leader died of dysentery. Participants in this event attacked the Pamunkey tribe in retaliation for a perceived administrative failure to halt attacks on the frontier. Begun in opposition to the policies of Governor William Berkeley, this event resulted in the burning of Jamestown. For 10 points, name this 1676 rebellion led by its namesake planter in the Colony of Virginia.

ANSWER: Nathaniel **Bacon's** Rebellion

014-12-71-05119

4. Some individuals who suffer from this condition have a higher than normal count of antibodies to AD-36 adenovirus in their bloodstream. A side effect of many amphetamines has resulted in the repurposing of those drugs to combat this condition. Suffers from this condition are often resistant to leptin. Increased risk of sleep apnea is one effect of this condition, which is also strongly linked with type 2 diabetes. A BMI higher than 35 results in the "morbid" form of this condition, often caused by a sedentary lifestyle. For 10 points, name this condition, the accumulation of excess body fat.

ANSWER: **obesity**

020-12-71-05120

5. One of these creatures made some of his guests wrestle with Old Age disguised as a woman and race against Thought disguised as "Hugi." The first of them was nursed by the primordial cow Audhumla (owd-HOOM-luh) before being slain by three brothers, including Vili and Ve. Those with power over fire came from Muspellheim (MOOSE-pell-hime), while others with power over frost occupied Niflheim (NIF-el-hime). For 10 points, name these enormous creatures, also called *jotunn* (YO-ton), who clash with the gods of Norse myth.

ANSWER: **giants** [or frost **giants**; or fire **giants**; or **jotunn** before it is read]

080-12-71-05121

6. In electric fields, this quantity is the cross product of the electric dipole moment and the field. In gyroscopes, this quantity produces a change in “L” that causes precession. For an orbiting body, this vector quantity always points perpendicular to the plane of the orbit. This quantity is equal to the time derivative of angular momentum. For 10 points, name this cross product of force and displacement, the angular analogue of force.

ANSWER: **torque**

121-12-71-05122

7. One spot at this location named “Hermite” once recorded a temperature at 25 Kelvin. A large feature at this location is a basin partially named for Robert Grant Aitken, which is 13 kilometers deep. The Clementine mission looked for evidence of water at this place. The “giant impact hypothesis” claims it was created by another object colliding with the entity Theia, which was about the size of Mars. One notable feature on this object is the Sea of Tranquility, which is where Apollo 11 landed. For 10 points, name this satellite of the third planet from the sun.

ANSWER: Earth’s **Moon**

052-12-71-05123

8. One participant in the 1992 version of this event asked, "Who am I? Why am I here?" That participant, James Stockdale, was the last independent candidate to be included in this event. Lloyd Bentsen said to Dan Quayle that "you're no Jack Kennedy" in this event in 1988, and in this event in 2012, one participant used the word "malarkey." For 10 points, name this event, which was moderated in October 2012 by ABC's Martha Raddatz and featured Joe Biden and Paul Ryan.

ANSWER: United States general election **vice presidential debate** [or word forms for "vice presidential"; prompt on **debate**]

194-12-71-05124

9. In one of this author's stories, an abused wife waits under a chinaberry tree while her husband dies from a snakebite. In a novel by this author that Richard Wright criticized as being “quaint,” the protagonist narrates her story to her friend Pheoby after returning to Eatonville. This author of “Sweat” described the life of a Florida woman who grows beans with her third husband in the Everglades until he is bitten by a dog and catches rabies. For 10 points, name this African American novelist who created Janie Crawford in *Their Eyes Were Watching God*.

ANSWER: Zora Neale **Hurston**

121-12-71-05125

10. In Latin, words of this type which are also periphrastic are accompanied by dative nouns rather than ablative ones, and Latin words that conjugate like this construction without being in it are known as deponent. In Spanish, sentences starting with an impersonal “se” are often translated using this construction. For 10 points, name this verbal form, which in English uses the auxiliary verb be and a past participle, and is exemplified by the sentence “Mistakes were made.”

ANSWER: **passive voice**

104-12-71-05126

11. The key step in the Bessemer process is the removal of impurities from iron through this type of reaction. Potassium permanganate and nitric acid usually catalyze this class of reaction. These reactions occur at the anode of a galvanic cell. Hydrocarbons undergo the "complete" form of it in combustion reactions, producing carbon dioxide. In this type of reaction, its namesake "state" increases as one species loses electrons. For 10 points, name this type of reaction which occurs with a corresponding reduction in redox reactions.

ANSWER: **oxidation** [prompt on "redox" or "reduction-oxidation" reactions before mention]

190-12-71-05127

12. Leaders in this religion include Angad, and the pillars of this religion include Kirat, Karni, and Vand Chakko. The supreme figure in this religion is Waheguru, and the tenth and final human leader of this religion was named Gobind Singh. Followers of this religion wear the Five K's, and the *Adi Granth* was largely written by its founder, Guru Nanak. For 10 points, identify this Indian religion originating in the Punjab region, whose followers often wear turbans.

ANSWER: **Sikhism**

189-12-71-05128

13. Paul Erdos created a proof showing that the count of these numbers less than or equal to  $x$  asymptotically approaches " $x$  over the natural logarithm of  $x$ ." Goldbach's conjecture proposes every even integer can be written as the sum of two of these. Euclid proved there were infinitely many of these, and the fundamental theorem of arithmetic states all natural numbers can be uniquely factored into these numbers. For 10 points, name these numbers divisible by only one and themselves.

ANSWER: **prime** numbers

121-12-71-05129

14. Drosha, Pasha, and Dicer are components of a pathway resulting in the formation of the "micro" variety of these molecules. One type of these molecules adds a poly-A tail after splicing separates the non-functional introns from the exons. Another of these molecules is shaped like a cloverleaf and interacts with the P and A sites. One type reads an anticodon that is complementary to the codon of the other, which is made via transcription. For 10 points, name these nucleic acids that contain uracils, come in "transfer" and "messenger" types, and use ribose as a sugar.

ANSWER: **RNA** [or **ribonucleic acid**; accept **tRNA** and **transfer RNA** before mentioned; accept **mRNA** and **messenger RNA** before mentioned]

020-12-71-05130

15. In one of his last appearances, this character poses as the informant Altamont to catch German agent Von Bork in the story "His Last Bow." This man's brother spends his time at the Diogenes Club and is named Mycroft. This character becomes intrigued with the opera singer Irene Adler in the story "A Scandal in Bohemia." In "The Final Problem," this hero seems to die at Reichenbach Falls while fighting his nemesis, Professor Moriarty. For 10 points, name this genius detective created by Arthur Conan Doyle who partners with Dr. Watson.

ANSWER: **Sherlock** Holmes [or Sherlock **Holmes**]

052-12-71-05131



1. In response to high blood pressure, this organ releases a natriuretic peptide to lower adipose tissue, sodium, and water. In fetuses, this organ contains an opening known as the foramen ovale. Intercalated disks and calcium-induced calcium release are properties of a cell unique to this organ. The letters P, Q, R, S, and T denote stages of action potentials in this organ, which go through the bundle branches to the Purkinje fibers after originating in the SA node. This organ contains four valves and sends deoxygenated blood through the pulmonary artery. For 10 points, name this organ with atria and ventricles, which pumps blood to the rhythm of a beat.

ANSWER: **heart**

020-12-71-05132

2. This man lost a senatorial nomination to Alexander Wiley in 1944, and the validity of this man's claims were investigated by a committee led by Millard Tydings. This man was once asked by Joseph Welch, "Have you no sense of decency, sir, at long last?" This man was involved in 1954 hearings pertaining to his allegations against members of the Army. For 10 points, identify this Wisconsin Republican Senator known for audaciously accusing members of the government of being Communist spies.

ANSWER: Joseph Raymond **McCarthy**

189-12-71-05133

3. The lack of linear separability of the XOR function led to its namesake problem in these models. Rumelhart and McClelland introduced the backpropagation algorithm for training the feedforward type of these models. These models were inspired by a biological unit is activated when it receives a signal from dendrites through synapses and then emits a signal to an axon. For 10 points, identify these mathematical models inspired by neurons.

ANSWER: artificial **neural networks** [or **ANNs**]

066-12-71-05134

4. This novel's narrator lets a boiler explode in the Liberty Paints factory and gets a scholarship to college after reaching for gold coins on an electrified rug. Dr. Bledsoe expels this novel's protagonist, who hides with 1369 light bulbs after he faces the radical Ras the Exhorter and the Communists in Harlem. For 10 points, name this novel whose nameless protagonist eventually cherishes the anonymity of being black, by Ralph Ellison.

ANSWER: **Invisible Man** [do not accept "*The Invisible Man*"]

104-12-71-05135

5. This concept is clarified in Rabbi Nehemiah's *Mishnat ha-Middot*, which corrects a Bible verse regarding a ceremonial pool in the Temple of Solomon. In 1897, an Indiana mathematician attempted to pass a bill to legislate this concept, but failed. Madhava's formula was the first known approach to this concept based on infinite series, improving on a polygonal approach used by Ptolemy and Archimedes. The builders of the Great Pyramid of Giza were the first known people to have awareness of this concept, which later people approximated as 22/7. For 10 points, name this constant, the ratio of a circle's circumference to its diameter.

ANSWER: **pi** [or **3.141592653** and so on]

020-12-71-05136

For a vector, what value can be found by taking the square root of its dot product with itself or the square root of the sum of the squares of the components?

ANSWER: **magnitude**

This is a 20-second calculation question. Find the median of the following set of data: 1, 16, 2, 7, 9, 10, 13, 5, 4

ANSWER: 7