

# Round 2

## First Half

(1) **In 1770, Lagrange proved that every positive integer can be written as the sum of four of these numbers. The  $n$ th one of these numbers is equal to the sum of the first  $n$  odd numbers; these numbers can also be written as the sum of two consecutive (\*) triangular numbers, as commonly seen in a geometric proof combining two triangles. For ten points, name this type of number, such as 1, 4, 9, and 16, which have integer square roots.**

ANSWER: perfect square numbers

(1) In this type of shape, the hypotenuse is guaranteed to be opposite the largest angle. For ten points each,

Name these figures, whose side lengths obey the Pythagorean Theorem.

ANSWER: right triangles (prompt on triangles; do not accept any other type of triangle)

A right triangle follows the Pythagorean Theorem, a special case of the law named for this trigonometric function, the complementary function of sine.

ANSWER: Law of cosines

This is the smallest angle in an isosceles right triangle.

ANSWER: 45 degrees (or pi over 4 radians) [In an isosceles right triangle, the two non-right angles will be congruent, so they are each 45 degrees.]

(2) **In this novel, Governor Bellingham fails to notice that his sister, Mistress Hibbins, is a witch, and Roger Chillingworth discovers the protagonist's relationship with Reverend Dimmesdale, which led to the birth of (\*) Pearl. For ten points, name this Nathaniel Hawthorne novel, in which Hester Prynne is forced to atone for her adultery by wearing a red "A" on her chest.**

ANSWER: The Scarlet Letter

(2) This character lives with Miss Watson and Widow Douglas, and his friend Buck is a causality in the blood feud between the Grangerfords and Shepherdsons. For ten points each,

Name this friend of Tom Sawyer who travels down the Mississippi River with the slave Jim in a novel named after this boy.

ANSWER: The Adventures of Huckleberry Finn (accept either underlined name)

This American creator of Tom Sawyer and Huckleberry Finn wrote about Hank Morgan going back in time in *A Connecticut Yankee in King Arthur's Court*.

ANSWER: Mark Twain (or Samuel Langhorne Clemens)

In this Mark Twain novel, the poor boy Tom Canty switches place with Edward, the son of Henry VIII.

ANSWER: The Prince and the Pauper

(3) In *Bambi II*, this actor voiced the Great Prince of the Forest, and in another role, he oversaw the destruction of the *Saratoga* as Locutus. This close friend of Sir Ian (\*) McKellen played the captain of the *USS Enterprise*, and has a recurring role as Charles Xavier, the founder of the X-Men. For ten points, name this English actor who played Captain Jean-Luc Picard on *Star Trek: The Next Generation*.

ANSWER: Sir Patrick Stewart

(3) This company has built an empire on the sale of virtual hats. For ten points each,

Name this company, which created the games *Dota 2* and *Half-Life*, both of which are available for download on its Steam gaming platform.

ANSWER: Valve Corporation (accept Valve Software)

Valve's reputation for selling virtual hats comes from downloadable content for this 2007 team-based first-person shooter. In this game, players can play as a Heavy, Scout, Soldier, Engineer, Spy, Sniper, Demoman, Medic, or Pyro.

ANSWER: Team Fortress 2 (or TF2; do not accept "Team Fortress Classic")

Valve has been jokingly mocked for not being able to make games with this number in their title. Valve series that lack a game with this number include *Portal*, *Team Fortress*, and, most notably, *Half-Life*.

ANSWER: three (accept third games; accept Portal 3; accept Team Fortress 3 or TF3; accept "Half-Life 3 Confirmed")

(4) For a particle, this quantity can be found by squaring the momentum and dividing by twice the mass. Temperature is the average value of this quantity for every particle in an object. Change in this (\*) energy is equal to the work done on a system, since this type of energy relies on the object's mass and its velocity squared. The energy of motion is called, for ten points, what term, contrasted with potential energy?

ANSWER: kinetic energy (accept KE; prompt on "energy" before it is read)

(4) Most of Earth's water is undrinkable salt water, and most of the freshwater is frozen and difficult to access. For ten points each,

This continent is, predictably, home to the largest ice sheet in the world; the effort in traveling to the South Pole to harvest it for drinking water is surely not worth it.

ANSWER: Antarctica

Cumulonimbus clouds can release this form of solid ice, some of which can be the size of baseballs. You wouldn't drink this for the same reasons you wouldn't drink rainwater, in addition to the danger of physical injury.

ANSWER: hail

Melting glaciers are a reliable source of freshwater; that said, walking along a glacier presents its own dangers, such as the risk of falling into one of these deep fractures of the surface of a glacier.

ANSWER: crevasse

(5) **After this man's assassination, the Prime Minister of his country said "The light has gone out of our lives." This leader called the Untouchables "children of God," and this proponent of satyagraha led a march to Dandi to protest a tax on (\*) salt.** Nathuram Godse assassinated this man in 1948, a few months after his country broke away from British rule. For ten points, name this nonviolent leader of the Indian independence movement.

ANSWER: Mohandas (or Mahatma) Gandhi

(5) This man echoed the Gettysburg Address by opening a speech "Five score years ago, a great American in whose symbolic shadow we stand today signed the Emancipation Proclamation". For ten points each,

Name this civil rights leader who gave the "I Have a Dream" speech after leading a 1963 march on Washington D.C.

ANSWER: Martin Luther King Jr.

King gave his "I Have a Dream" speech in the shadow of this memorial, across the National Mall's reflecting pool from the Washington Memorial.

ANSWER: Lincoln Memorial

King's "I Have a Dream" speech ends with three repetitions of this spiritual phrase and the exclamation "Thank God Almighty."

ANSWER: (we are) free at last

(6) **At the 1824 premiere of one of this composer's works, the orchestra finished before he had finished conducting. This composer wrote the Heiligenstadt Testament to his brother, lamenting his growing disability; that letter was written a year before he composed a (\*) symphony nicknamed *Eroica*.** For ten points, name this German composer whose *Choral* symphony, his ninth, was written after he had completely lost his hearing.

ANSWER: Ludwig von Beethoven

(6) This Italian created designs for flying machines and water-walking shoes. For ten points each, Name this multi-talented man, who painted *Madonna of the Rocks* and *The Last Supper*.

ANSWER: Leonardo da Vinci (accept either underlined portion)

Leonardo was active during this historical period that followed the medieval period. A common description for people like Leonardo, who work in many different disciplines, uses this adjective.

ANSWER: Italian Renaissance

This anatomical drawing by Leonardo shows a man inside of a circle and a square, and includes detailed notes on the proportions of the human body.

ANSWER: The Vitruvian Man (accept The Canon of Proportions; accept The Proportions of Man; accept Le proporzioni del corpo umano secondo Vitruvio; accept L'Uomo Vitruviano)

(7) **This organelle may have developed from an endosymbiotic relationship with a consumed prokaryote. This organelle's DNA is passed only from mothers to their children, and its inner membrane contains folds called (\*) cristae.** This organelle's "matrix" is responsible for using the Krebs cycle to make ATP, a molecule that moves energy through a cell. For ten points, name this organelle, the "powerhouse of the cell."

ANSWER: mitochondria (or mitochondrion)

(7) Space telescopes orbit the Earth, allowing observation without worrying about light pollution and other pesky issues on the ground. For ten points each,

This most famous space telescope went into low Earth orbit in 1990 and is named for an American astronomer.

ANSWER: (Edwin) Hubble Space Telescope

The Hubble Space Telescope operates in the UV, visible, and infrared ranges, but some space telescopes capture these rays produced by high-energy photons. This type of radiation has energy between UV and gamma rays.

ANSWER: x-rays

In 2018, this American space agency plans to launch the James Webb Space Telescope; Webb served as this organization's administrator during the *Apollo* missions.

ANSWER: NASA (or National Aeronautics and Space Administration)

## Halftime

The categories are ...

1. British Poetry
2. Sweet Home Chicago
3. Planets
4. European Art

### BRITISH POETRY

Name the British poet, poem, or character that...

(1) is the subject of the poetry collection *Now We Are Six*, along with Piglet and Christopher Robin.

ANSWER: Winnie-the-Pooh (accept Pooh-Bear; accept Edward Bear)

(2) wrote the poem "If—" and the novel *The Jungle Book*.

ANSWER: Rudyard Kipling

(3) wrote the poem "Auld Lang Syne," which is commonly sung at New Year's.

ANSWER: Robert Burns

(4) is the long-reigning Tudor queen who is the subject of Spenser's *The Faerie Queene*.

ANSWER: Queen Elizabeth I (prompt on "Elizabeth")

(5) is a wild cat "burning bright / in the forests of the night" in a William Blake poem.

ANSWER: The Tyger

(6) collaborated on the poetry collection *Lyrical Ballads* with Coleridge.

ANSWER: William Wordsworth

## SWEET HOME CHICAGO

In the history and geography of Chicago, name the...

(1) U.S. state, in which it is the largest city.

ANSWER: Illinois

(2) Great Lake on whose shores it lies.

ANSWER: Lake Michigan

(3) airport with code ORD that is among the busiest airports in the world.

ANSWER: O'Hare International Airport

(4) tragedy that struck Chicago in 1871, possibly after Mrs. O'Leary's cow kicked a lantern.

ANSWER: (Great Chicago) Fire

(5) current Mayor of Chicago and former Chief of Staff for President Obama.

ANSWER: Rahm Emanuel

(6) family which has placed a father and son, both named Richard, in the Mayor's office in the last century.

ANSWER: Daley family

## PLANETS

Which planet in the solar system is...

(1) nearest to the Sun?

ANSWER: **Mercury**

(2) orbited by Titan, Rhea, and the most rings of any planet in the Solar System?

ANSWER: **Saturn**

(3) closest in size to the Earth?

ANSWER: **Venus**

(4) furthest from the Sun, now that Pluto is a dwarf planet?

ANSWER: **Neptune**

(5) being studied by the *Opportunity* and *Curiosity* rovers?

ANSWER: **Mars**

(6) holds clusters of Trojan minor planets at its Lagrangian points?

ANSWER: **Jupiter**

## EUROPEAN ART

Name...

(1) the European city that is home to Rodin's *The Thinker* and the Louvre museum.

ANSWER: **Paris**, France

(2) the biblical figure that Michelangelo sculpted with horns and the Ten Commandments tablets.

ANSWER: **Moses** (accept **Moshe**; accept **Musa**)

(3) the copper-based metal alloy used by Donatello for his *David*.

ANSWER: **bronze**

(4) the painting technique that uses small dots to form large images, as used by Georges Seurat.

ANSWER: **pointillism** (accept word forms like **pointillist**)

(5) the Dutch master who painted *The Night Watch* and *The Anatomy Lesson*.

ANSWER: **Rembrandt** van Rijn

(6) the Norwegian artist of *The Scream*.

ANSWER: Edvard **Munch**

## Second Half

(1) **This man appointed the Tower Commission to investigate a scandal during which the Boland Amendment was violated. In 2014, James Brady died from complications resulting from an assassination attempt on this man. A year after the (\*) Iran-Contra affair was revealed, this president told Mikhail Gorbachev to “tear down” the Berlin Wall. For ten points, name this Republican president who served for much of the 1980s.**

ANSWER: Ronald Reagan

(1) This man came to power as vice president under Ahmed Hassan al-Bakr. For ten points each, Name this former Middle Eastern dictator. His country was invaded in 2003 after the United States claimed that he had weapons of mass destruction.

ANSWER: Saddam Hussein Abd al-Majid al-Tikriti

Saddam Hussein held power in this country, where he led from Baghdad.

ANSWER: Republic of Iraq

Under Saddam Hussein, Iraq invaded this neighboring country in 1990, triggering the First Gulf War.

ANSWER: State of Kuwait

(2) **This god’s son merged with Salmacis to become both male and female. This god’s attributes include the petasos hat, the caduceus staff, and the talaria, which were made by Hephaestus. This patron god of thieves helped Perseus (\*) fly by lending him this god’s winged sandals. For ten points, name this Greek messenger god, associated with the Roman god Mercury.**

ANSWER: Hermes (accept Mercury before it is read)

(2) Name some cities important in early Islamic history, for ten points each.

The Prophet Muhammad is from this city in Saudi Arabia. It is home to the Ka’aba, and Muslims must make a pilgrimage to this city at least once in their lives.

ANSWER: Mecca (prompt on “Bakkah”)

Prophet Muhammad moved from Mecca to this city, which is home to the Masjid-al-Nabawi. The four Rightly-Guided caliphs governed from this city.

ANSWER: al-Medina al-Munawwarah (accept Yathrib)

In his Night Journey, the prophet Muhammad traveled to this Middle Eastern city before ascending to heaven. This city is home to the Dome of the Rock.

ANSWER: Jerusalem (accept al-Quds; accept Yerushalayim)

(3) **An author from this country recorded observations about court life in *The Pillow Book*. An 11th-century book from this country about the husband of Princess Aoi [ah-oh-ee] is considered by many to be the first (\*) novel.** An author from this country described a frog jumping into a pond in a poem that is seventeen syllables long. For ten points, name this Asian nation, the setting of *The Tale of Genji*, where Matsuo Basho wrote many haiku.

ANSWER: Japan (or Nippon-koku)

(3) This novel's protagonist works with Stoneman, Black, and Captain Beatty at a firehouse. For ten points each,

Name this science fiction novel whose protagonist burns books. At the end of this novel, the protagonist kills Captain Beatty and the Mechanical Hound.

ANSWER: Fahrenheit 451

This author wrote *Fahrenheit 451*. He also wrote about Douglas Spaulding in his semi-autobiographical novel *Dandelion Wine*.

ANSWER: Ray(mond) Douglas Bradbury

This fireman is the protagonist of *Fahrenheit 451*. His wife Mildred locks herself in the bathroom after he recites "Dover Beach" to Mildred and her friends.

ANSWER: Guy Montag (accept either underlined name)

(4) **This document notes "no religious Test shall ever be required" to hold office. It was most recently edited in 1992 to prevent self-appointed pay raises in a process outlined by its fifth (\*) article,** and its first three articles detail the legislative, executive, and judicial branches. The President swears an oath to protect and defend, for ten points, what supreme law of the United States that has been amended 27 times?

ANSWER: U.S. Constitution

(4) For ten points each, name the following Italian cities.

When visiting this capital city of Italy, tourists can visit the Colosseum, Pantheon, and the Trevi Fountain.

ANSWER: Rome [or Roma]

Tourists in this Italian city often visit the Doge's Palace in the Piazza San Marco and can go on a gondola ride in its canals.

ANSWER: Venice

Art enthusiasts visiting this capital city of Tuscany can see Lorenzo Ghiberti's *Gates of Paradise* and visit the Uffizi Gallery.

ANSWER: Florence

(5) **This character helps Mary Morstan discover why she is receiving mysterious pearls in *The Sign of Four*, which reveals this character's drug addiction. This character retires to the country to keep (\*)** bees long after appearing to die at Reichenbach Falls. He opposes the nefarious Professor Moriarty and is aided by Dr John Watson. For ten points, name this great detective created by Sir Arthur Conan Doyle.

ANSWER: Sherlock Holmes

(5) Answer the following about novels that feature an appearance by Robin Hood, for ten points each.

In this novel by T.H. White, a young King Arthur meets Robin Hood under the name Robin Wood. This novel follows Arthur's education by the wizard Merlin.

ANSWER: The Sword in the Stone

Robin Hood, as Locksley, helps the title knight in this novel by Sir Walter Scott, whose protagonist marries Rowena and fights alongside Richard I.

ANSWER: Ivanhoe

In *The Sword in the Stone* and *Ivanhoe*, Robin Hood and his Merry Men live as outlaws in this forest in Nottinghamshire.

ANSWER: Sherwood Forest

(6) **In 1986, this country's Prime Minister, Olof Palme, was murdered by an unknown man. In 1956, this country's warship *Vasa* was salvaged. Russia was defeated by this country's Charles XII at Narva during the Great (\*)** Northern War, and during the Thirty Years' War, this country was led by Gustavus Adolphus. For ten points, name this Scandinavian country, once part of the Kalmar Union with Denmark and Norway, whose capital is Stockholm.

ANSWER: Kingdom of Sweden (or Konungariket Sverige)

(6) This man's attempts to gain funding from Portugal were denied, as were his first attempts in Spain. For ten points each,

Name this Italian explorer, commonly credited with discovering America in 1492.

ANSWER: Christopher Columbus

Columbus' expeditions were eventually funded by Ferdinand and this queen of Castile.

ANSWER: Isabella I of Castile

Ferdinand and Isabella finally granted Columbus his funding after the conquering of Granada marked the end of this centuries-long period of conflict between Christian and Islamic kingdoms in Spain.

ANSWER: Reconquista

(7) **The Meyers one of these regions sits next to the Dominion Range, and is the coldest one of these areas on Earth. One of these regions is created by a “shadow” on the leeward side of the Andes mountains, over which (\*) clouds cannot pass; that one is the Atacama. Other examples of these biomes are the Gobi and the Sahara. For ten points, name this type of dry biome, which receive very little rainfall and are usually sandy.**

ANSWER: desert

(7) Because Australia is isolated from other continents, its animals evolved radically differently than those living elsewhere. For ten points each,

This animal’s closest relative is the wombat. The forepaws of this arboreal mammal have two opposable fingers to climb eucalyptus trees.

ANSWER: koala (accept koala bear)

Koalas are often incorrectly referred to as “bears;” they are really a member of this infraclass, which have external pouches in which their young develop.

ANSWER: marsupials

Koalas have a short, vestigial form of this body part. Kangaroos can stand on this body part while they kick with both feet.

ANSWER: tail

## Extra Question

Only read if you need a backup or tiebreaker!

(1) **The crew of the SS *Lucky Dragon 5* were accidental victims of this general class of weapon when it was tested as part of Castle Bravo, an operation which took place in Bikini Atoll. The doctrine of (\*) “Mutually Assured Destruction” concerned these weapons, which were developed by the Manhattan Project. These weapons are divided into “hydrogen” and “atom” types depending on whether they use primarily fission or fusion. For ten points, what class of weapon was dropped on Hiroshima and Nagasaki?**

ANSWER: nuclear bomb (accept Hydrogen bomb or thermonuclear bomb until “Manhattan Project” is read; prompt on “hydrogen bomb,” “H-bomb,” or “thermonuclear bomb” after “Manhattan Project” is read and before “hydrogen” is read; prompt on “atomic bomb,” “atom bomb,” or “A-bomb” until “atom” is read; prompt on “bomb;” accept “weapon” in place of “bomb” in any of these answers)