

Round 3

First Half

(Tossup 1) **One type of object with this name can be described by adjectives like acyclic, bipartite, or directed and is frequently used to represent networks. This term is also used to describe objects that are analyzed using the horizontal or vertical line tests; those objects are usually created using a namesake type of (*) paper or a namesake type of calculator. For ten points, name this term most commonly used to describe models of functions drawn in the x-y plane.**

ANSWER: **graphs**

(Bonus 1) Stirling's formula may be used to approximate this function. For ten points each,

[Part A] Name this function represented by an exclamation point. For a number n , this function equals the product of integers from 1 to n .

ANSWER: **n factorial**

[Part B] Factorials are used to calculate the number of ways to arrange a set of items in order, which is given this name.

ANSWER: **permutation** (accept word forms such as **permute**; do not accept combinations; do not accept choose)

[Part C] 1 factorial is equal to 1, and this number's factorial is conventionally treated to be 1.

ANSWER: **zero**

(Tossup 2) **A character in this book makes her own nail polish using rattlesnake venom to deepen the color. In this novel, a poster of Clyde Livingston is confiscated by the police as evidence after the protagonist is arrested for stealing Livingston's shoes and sent to (*) Camp Green Lake. Stanley Yelnats is the main character of, for ten points, what novel by Louis Sachar about a juvenile corrections camp in the desert where boys are forced to dig for buried treasure?**

ANSWER: **Holes**

(Bonus 2) This character is punished by being sent to the Red Room while living with her uncle at Gateshead Hall. For ten points each,

[Part A] Name this woman who flees from her engagement to Mr Rochester after she discovers that he is already married to the insane Bertha Mason.

ANSWER: **Jane Eyre** (accept either underlined portion)

[Part B] This author of *Jane Eyre* was a member of a prominent British literary family of the 19th Century.

ANSWER: Charlotte **Brontë** (prompt on Brontë)

[Part C] Charlotte Brontë drew on her experiences in this profession to write portions of *Jane Eyre*. Jane works for Mr Rochester and his ward, Adèle Varens, by performing this job.

ANSWER: **governess** (or nanny; prompt on caretaker or teacher)

(Tossup 3) **The composer of this work noted that “Joy follows sorrow; sunshine, rain” in explaining why this work is in C minor but unusually ends in C major with 29 bars of loud, triumphant chords. This symphony premiered on the same night as its composer’s (*) Pastoral symphony, which is numbered one higher. A famous “Fate knocking at the door” motif opens, for ten points, what symphony by Ludwig von Beethoven whose main theme follows a “short, short, short, long” rhythm?**

ANSWER: Ludwig von Beethoven’s **5th** Symphony

(Bonus 3) Name the following percussion instruments. For ten points each,

[Part A] A series of wires are held in tension on the underside of this type of drum, giving it a staccato sound. Bass drums, toms, and this type of drum are found in a basic drum set.

ANSWER: **snare** drum

[Part B] “Kettledrum” is an alternate name for these large drums, which can be tuned by the performer and are typically played with mallets rather than drumsticks.

ANSWER: **timpani**

[Part C] In an orchestra, a xylophone will have wooden bars, while this similar German-named instrument uses plates of metal instead.

ANSWER: **glockenspiel**

(Tossup 4) **The rulers of this country issued the Alhambra Decree to expel practicing Jews. By defeating the Nasrid dynasty in the Granada War, this kingdom completed the (*) Reconquista by ending Islamic rule of the Iberian Peninsula. For ten points, name this country where a namesake inquisition was established by Ferdinand and Isabella.**

ANSWER: **Spain**

(Bonus 4) Answer some questions about the fall of the Russian Empire. For ten points each,

[Part A] Name this final Tsar of Russia. This man lost much of his public support due to the unpopularity of World War I and his family’s connections to the mystic Rasputin.

ANSWER: **Nicholas II** (prompt on Nicholas; accept **Saint Nicholas the Passion-Bearer**)

[Part B] Nicholas II was overthrown, and later executed, by members of this faction. This faction, co-founded by Alexander Bogdanov, succeeded in overthrowing Alexander Kerensky’s provisional government. ANSWER: **Bolsheviks** (accept Bolsheviks)

[Part C] The Bolsheviks were co-founded by this revolutionary who became the first leader of the Soviet Union.

ANSWER: Vladimir **Lenin** (accept Vladimir Ilyich Ulyanov)

(Tossup 5) **A 2019 study conducted at a historical museum in Rennes found that many mummies of these animals actually contained pieces of multiple animals, rather than a single one. Thousands of these animals were buried in Bubastis to honor the goddess (*) Bastet, who had the head of this animal.** For ten points, name these household pets that were called “miu” in ancient Egypt to mimic their meows.

ANSWER: **cats** (accept common nicknames like **kitty-cat** or **pussy-cat**; accept **felines**; accept **felis catus** or **felis silvestris catus**; accept Egyptian wildcat or **felis silvestris lybica**; accept **mau**; accept **miu** or **miut** until it is mentioned; do not accept or prompt on “lion” or “lioness”)

(Bonus 5) This god’s trivikrama, or “three strides,” were enormous steps that crossed the earth, air, and heavens, establishing this god’s domain. For ten points each,

[Part A] Name this Hindu preserver god, who forms the Trimurti with Brahma and Shiva.

ANSWER: **Vishnu**

[Part B] Vishnu has frequently manifested as one of these physical beings, humans that contain and embody the spirit of Vishnu on earth. These manifestations of Vishnu include Kalki and Rama.

ANSWER: avatars of Vishnu

[Part C] This eighth avatar of Vishnu is independently worshipped as a god of compassionate love. This flute-playing god served as the prince Arjuna’s charioteer and advisor in the Bhagavad Gita. ANSWER: Krishna

(Tossup 6) **This nutrient is used as a cofactor for collagen formation. This nutrient’s use as a cold remedy was popularized by Linus Pauling, who advocated for (*) “megadoses” of this nutrient.** A deficiency in this nutrient causes skin spots and bleeding gums, a condition called scurvy. For ten points, name this vitamin that supports the immune system, which is found in large quantities in citrus fruits.

ANSWER: vitamin **C** (accept ascorbic acid)

(Bonus 6) The radial velocity method can be used to detect these entities, as can gravitational microlensing. For ten points each,

[Part A] Name these non-solar system objects. Special methods must be used to detect them as they are much less than bright than the stars they orbit.

ANSWER: **exoplanets** (prompt on planets)

[Part B] Exoplanets may be detected in methods named for these occurrences when a celestial object passes in front of another celestial object, blocking out a small part of their light. Unlike in an eclipse or occultation, these events do not completely block out the farther object.

ANSWER: **transit**

[Part C] Transits of this celestial object tend to occur in pairs 8 years apart, after which there is usually a century long gap. Mason and Dixon observed the transit of this planet at the Cape of Good Hope.

ANSWER: **Venus**

(Tossup 7) **In what is now this country, the Expedition of a Thousand, led by Giuseppe Garibaldi, conquered a kingdom centered on Palermo. Victor Emmanuel II, the King of (*)** Sardinia, became the first person to assume the throne of this country in 1300 years after completing the Risorgimento in 1861. The Papal States were annexed by, for ten points, what country that absorbed the kingdoms of Sicily and Naples as part of its reunification?

ANSWER: **Italy** (accept **Italia**)

(Bonus 7) According to the *Critique of Judgement*, these objects are only beautiful if a disinterested observer would consider them beautiful. For ten points each,

[Part A] Name these objects that are the subject of the field of aesthetics. Examples of these objects include sculptures and paintings.

ANSWER: **works of art** (or artworks)

[Part B] This philosopher wrote *Critique of Judgement*, as well as two other critiques on reason. This philosopher's main work of ethics is *Groundwork of the Metaphysics of Morals*.

ANSWER: Immanuel **Kant**

[Part C] Immanuel Kant spent his entire life in the city of Königsberg, which was traditionally located in this country. Other philosophers from this country include Georg Wilhelm Friedrich Hegel and Martin Heidegger.

ANSWER: **Germany** (accept **Deutschland**)

(Tossup 8) **This country suffered from the 1991 collapse of an asset price bubble that ushered in the Lost Decade. In 2019, this country's Head of State abdicated, leading to an end of the (*)** Heisei period. The Prime Minister of this country has been criticized for visiting the Yasukuni Shrine, a Shinto shrine that honors fallen soldiers. Shinto Abe currently leads, for ten points, what East Asian nation from Tokyo?

ANSWER: **Japan** (accept Nihon-koku; accept Nippon-koku)

(Bonus 8) This desert is home to the Valle de la Lune, which has been used for moon rover testing. For ten points each,

[Part A] Name this desert in South America, which is commonly held to be the driest place on Earth.

ANSWER: **Atacama** Desert

[Part B] The Atacama desert is primarily found in this country, whose other natural landmarks include the penguin filled Chiloe island. This country's capital and largest city is Santiago. ANSWER: **Chile**

[Part C] Chile shares this archipelago with Argentina. This archipelago is separated from the mainland by the Straits of Magellan. This archipelago is crossed by the Beagle Channel.

ANSWER: **Tierra del Fuego**

Sixty-Second Rounds

The categories are . . .

1. Theatrical terms
2. The Ottoman Empire
3. Acids

Theatrical terms

Give the theatrical term meaning...

(1) New York City's theater district in general, or specifically the street where many of its theaters were built.

ANSWER: Broadway

(2) The set of actors and actresses who perform in a play, or the process of choosing an actor for a role. ANSWER: cast (or casting)

(3) A backstage area on either side of the stage, out of sight of the audience, where actors can wait to enter the stage.

ANSWER: wings

(4) A group of performers who speak together to provide context and explanation in ancient Greek theater.

ANSWER: chorus

(5) A Latin phrase meaning "god from the machine," an abrupt plot twist that resolves the action of a play.

ANSWER: deus ex machina

(6) The final part of the play in which the plot is resolved, a ten-letter term derived from French.

ANSWER: denouement

The Ottoman Empire

Name the...

(1) Modern-day country containing Istanbul that grew out of the empire.

ANSWER: Republic of Turkey

(2) Sultan, called the Magnificent, that ruled over an Ottoman golden age.

ANSWER: Suleiman I (accept Suleiman the Magnificent; accept Suleiman the Lawgiver (3)

City along the Tigris river, the capital of Safavid Persia, captured by that sultan in 1534.

ANSWER: Baghdad

(4) Infantry unit originally composed of kidnapped Christian children that was abolished after the Auspicious incident.

ANSWER: Janissary (accept Janissaries)

(5) Sultan that, in 1453, successfully captured Constantinople.

ANSWER: Mehmed II (accept Mehmed the Conqueror; accept Mehmet II; accept Mehmet the Conqueror; accept Fatih Sultan Mehmet; prompt on Mehmed; prompt on Mehmet)

(6) Palace constructed by that sultan that was the center of Ottoman government for 200 years.

ANSWER: Topkapi [toe-kap-u] Palace (accept Cannon Gate palace; accept Tokapu Sarayi)

Acids

Name the...

(1) Scale on which an acid's strength is measured between 0 and 7.

ANSWER: pH scale (do not accept or prompt on "pOH" scale)

(2) Counterpart of acids; they rank higher than 7 on that scale.

ANSWER: bases

(3) Positively-charged particle that is "donated" by an acid.

ANSWER: protons (accept hydrogen ion or H^+ , but do not accept or prompt on "hydrogen" or "H" alone)

(4) Weather phenomenon that corrodes steel structures and erodes stone statues, caused by pollution. ANSWER: acid rain

(5) Acid produced by the stomach to create gastric juice.

ANSWER: hydrochloric acid (or HCl; prompt on "gastric acid")

(6) Term for chemicals that can act as an acid or its counterpart, depending on its oxidation state.

ANSWER: amphoteric (accept word forms like amphoterism; accept amphiprotic)

Second Half

(Tossup 9) **While this author was completing *On Writing: A Memoir of the Craft*, he suffered a nearly career-ending car accident near his home in Maine. Novels by this author describe a telekinetic girl who seeks revenge for being doused in (*) pig's blood during prom and Louis Creed, a man who buries his son's corpse in an ancient burial ground to try to revive him. *Pet Sematary*, *Carrie*, and *It* are by, for ten points, what contemporary author of supernatural horror fiction?**

ANSWER: **Stephen Edwin King**

(Bonus 9) Mercury encourages the title character of this Roman poem to abandon Dido in Carthage and to follow his higher purpose. For ten points each,

[Part A] Name this epic poem whose title character later fights Turnus and other enemies in Italy.

ANSWER: **Aeneid**

[Part B] This Roman author of poetry collections like *Eclogues* and *Bucolics* wrote the *Aeneid*.

ANSWER: **Virgil** (or Publius **Vergilius** Maro)

[Part C] In the *Aeneid*, Aeneas is advised by the ghost of his dead wife, Creusa, to flee from this place, his home city.

ANSWER: **Troy**

(Tossup 10) **This location is home to the Vernal and Nevada Falls which can be viewed from Glacier Point. Clouds Rest and Mount Dana are two mountains found within this park. This park is home to (*) El Capitan and Halfdome Peak. For ten points, name this national park in the Sierra Nevada Mountain Range, located in eastern California.**

ANSWER: **Yosemite** National Park

(Bonus 10) In 2010, this country shelled Yeonpyeong Island. For ten points each,

[Part A] Name this Asian country led from Pyongyang. Leaders in this country have long been criticized for threatening military action in attempt to gain international aid.

ANSWER: **North Korea** (accept Pukchoson; accept the **Democratic People's Republic of Korea**: accept **DPRK**)

[Part B] North Korea has been led by three generations of this family. This family, referred to as the Mount Paektu Bloodline, included Il-Sung and Jong-il.

ANSWER: **Kim**

[Part C] North Korea's southern border is roughly set along this line of latitude. This line of latitude was used in the aftermath of the Korean War to form the demilitarized zone.

ANSWER: **38th Parallel** north

(Tossup 11) **A “ropy” form of this substance can create the pahoehoe variety of this substance. When this substance forms underwater, it can form the pillow variety of this substance. An extremely viscous form of this substance is (*) a’a [ah-ah].** This substance forms when magma reaches the surface. For ten points, name this substance, which along with gas and ash, is released by volcanoes.

ANSWER: **lava** (do not accept or prompt on magma)

(Bonus 11) The 18-electron rule is analogous to this rule in transition metals. For ten points each, [Part A] Name this statement regarding the number of valence electrons an atom prefers to have.

ANSWER: **octet** rule

[Part B] The octet rule explains the relative stability of this group of elements found on the right-most column of the periodic table.

ANSWER: **noble** gases

[Part C] Compounds containing this element violate the octet because its three valence electrons prevent it from bonding enough to fill an octet.

ANSWER: **Boron** (accept B)

(Tossup 12) **This building is home to the bourdon Emmanuel, which weighs 13 tons. A restoration of this building in the mid 1800s was led by Eugene Viollet-le-Duc. This building is located on the (*) î Ile de la Cité and contains some of the world’s oldest flying buttresses. In 2019, a fire broke out in this church, causing permanent damage.** For ten points, name this Gothic cathedral in Paris.

ANSWER: **Notre Dame** de Paris

(Bonus 12) This man’s role as Ethan Edwards in *The Searchers* inspired Buddy Holly to record “That’ll Be the Day.” For ten points each,

[Part A] Name this actor that rose to stardom in John Ford’s *Stagecoach*. In 1979, this man died of stomach cancer, likely due to unsafe set conditions for *The Conqueror*.

ANSWER: **John Wayne**

[Part B] *The Searchers* and *Stagecoach* are both films in this genre which often focuses on gunslingers. The spaghetti type of this film genre include Sergio Leone’s *The Good, the Bad, and the Ugly* and *A Fistful of Dollars*.

ANSWER: **westerns**

[Part C] Western films typically depict the lives of outlaws and this other profession. Members of this profession are often depicted wearing ten gallon hats as well as a namesake type of boot. ANSWER: **cowboys**

(Tossup 13) **Saint Augustine preached that this holiday's subject represented the "Sun of Righteousness" described by Malachi, and that this holiday should be held on the Romans calendar's (*) shortest day of the year.** Due to a Roman census, this holiday commemorates Joseph's journey to Bethlehem with his wife, who was forced to give birth in a stable. For ten points, name this Christian winter holiday that celebrates the birth of Jesus.

ANSWER: **Christmas Day** (accept **Noël**; accept **Nativity of Jesus**; prompt on "Yule;" prompt on "December 25;" do not accept or prompt on "Christmas Eve")

(Bonus 13) The mythical king Tantalus was trapped in this realm between a fruit tree that pulled back its branches when he tried to eat and a pool of water that receded when he tried to drink. For ten points each,

[Part A] Tantalus received his punishment in this mythical realm as a consequence for the crimes he committed in life.

ANSWER: **Hades** (accept Tartarus; accept Greek underworld or afterlife)

[Part B] Tantalus was punished for doing this to his son, Pelops, at a meeting of the gods. ANSWER: **sacrificing him** (accept descriptions; accept descriptions of serving Pelops as food; prompt on "killing him")

[Part C] This goddess of the harvest was so distraught by the recent loss of her daughter, Persephone, that she unthinkingly ate part of Pelops when Tantalus served him.

ANSWER: **Demeter**

(Tossup 14) **In a novel by this author, Dolge Orlick is arrested for burglary and assaults Mrs Joe, a blacksmith's wife. A character created by this author is nicknamed "Trot" while he lives with his Aunt Betsey. Uriah Heep and Miss (*) Havisham appear in novels about the coming-of-age of Pip and David Copperfield in works by this man.** For ten points, name this British author of *Great Expectations*.

ANSWER: Charles **Dickens**

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(Bonus 14) One of this writer's poems describes two roads that "diverged in a yellow wood." For ten points each,

[Part A] Name this American poet of "Birches" and "The Road Not Taken."

ANSWER: Robert Lee **Frost**

[Part B] In another Robert Frost poem, the speaker hears the "sweep / of easy wind and downy flake" when he stops on horseback to watch the woods "fill up with" this substance on "the darkest evening of the year."

ANSWER: **snow** (accept Stopping by Woods on a Snowy Evening)

[Part C] In this poem, Frost describes working with a man who claims that "good fences make good neighbors" to rebuild a barrier between their orchards of pine and apple trees.

ANSWER: **Mending Wall**

(Tossup 15) **This man's wife was captured in a self-described "tasteless" photograph by Cecil Stoughton which shows her aboard Air Force One. A recording by Abraham (*)** Zapruder shows an attack on this President as his motorcade passed through Dealey Plaza. Lyndon B. Johnson succeeded, for ten points, what President of the United States who was assassinated by Lee Harvey Oswald in Dallas?

ANSWER: **John F. Kennedy** (accept **JFK**; prompt on Kennedy)

(Bonus 15) In 2017, this woman became the first British monarch to celebrate a Sapphire Jubilee. For ten points each,

[Part A] Name this current Queen of the United Kingdom who ascended to the throne after the death of her father George VI.

ANSWER: **Elizabeth II** (prompt on Elizabeth)

[Part B] George VI was a member of this royal house. This house was created after George V, wanting to distance himself from its German roots, changed the name of the House of Saxe-Coburg and Gotha.

ANSWER: House of **Windsor**

[Part C] George VI ascended to the throne after this man, his brother, was forced to abdicate. This husband of Wallis Simpson was made Governor of the Bahamas due to his alleged Nazi sympathies.

ANSWER: **Edward VIII**

(Tossup 16) **The island of stability is a theoretical range for this figure. The most recent major change to this figure was made by Glenn Seaborg. The lanthanides and (*) actinides are located beneath the main body of this figure. This figure was first developed in its modern form by Dmitri Mendeleev. For ten points, name this table that displays the atomic weight, symbol, and number of every element.**

ANSWER: **periodic table**

(Bonus 16) The segments of this structure are known as the duodenum, jejunum, and ileum. For ten points each,

[Part A] Name this digestive organ responsible for absorbing nutrients. Brush border enzymes in this organ break down disaccharides [DYE-sack-a-rides] like maltose and sucrose.

ANSWER: **small intestine** (prompt on intestine, do not accept large intestine)

[Part B] Protein digesting enzymes enter the small intestine after being produced in this organ which also produces insulin.

ANSWER: **pancreas**

[Part C] This term refers to the mix of stomach acid and food that enters the small intestine from the stomach

ANSWER: **chyme** [KIME]

Tiebreakers

(Tossup 17) **One philosopher from this country advocated for gradual change and is considered the father of modern conservatism. In addition to that author of *Reflections on the Revolution in France*, another philosopher from this country outlined his theory of liberalism in (*) *Two Treatises of Government*. For ten points, name this home country of Edmund Burke and John Locke, whose scholars often worked at Oxford.**

ANSWER: **United Kingdom of Great Britain and (Northern) Ireland** (accept **UK**; accept **Great Britain**; accept **England**)

(Bonus 17) The cyclops long beaked variety of these animals is only found in New Guinea. For ten points each,

[Part A] Name these spiny, egg laying mammals, a close relative of the platypus. ANSWER: **echidnas**

[Part B] The echidna and platypus are both members of this mammalian order, whose name means "one hole."

ANSWER: **monotremes** (accept monotremata)

[Part C] Monotremes are believed to be more closely related to this type of mammal than they are to placental mammals. These mammals have pouches and include opossums and kangaroos. ANSWER: **marsupials** (accept **marsupialia**)