

by Bill Tressler

with thanks to Alex Dzurick, Bern McCauley, and the Great Valley Quiz Team

Tossups

1. Also called "gravitational drag", this term names a "dynamical formula" by Chandrasekhar [CHAN-duh-SEK-err] that describes bodies moving in outer space. This force studied by tribologists is proportional to normal load and independent of surface size according to laws by Guillaume Amontons. (*) Hydroplaning occurs when this is unintentionally reduced, and materials decreasing it are lubricants. For 10 points—give this term for the force resisting materials sliding against each other, which you exploit to generate heat when you rub hands together.

answer: friction (accept dynamical friction or Chandrasekhar friction)

2. This literary region contains the tree used in John André's hanging, and is near Sing-Sing village and Wiley's Swamp. One of its residents, Hans Van Ripper, owns the horse Gunpowder, and its bachelor Abraham Van Brunt rides Daredevil. According to Diedrich Knickerbocker, this place was (*) cursed by a High German doctor or Native American chief. At a party hosted here by Balt Van Tassel, locals told tales of a galloping Hessian who carried a face not attached to shoulders. For 10 points—name this place where Ichabod Crane met the Headless Horseman.

answer: Sleepy Hollow (accept The Legend of Sleepy Hollow) [Abraham Van Brunt is better known by the nickname Brom Bones]

3. After this leader met with Mahmoud Abbas in 2012, a Bethlehem street was named for him. This man is thought to own five percent of Gazprom and may be the owner of the Residence at Cape Idokopas on the Black Sea. During a June 2017 call-in show he offered James Comey (*) asylum. This holder of a judo black belt has been photographed riding horses without a shirt. A leader of the Yedinaya Rossiya political party, he traded jobs with Dmitry Medvedev due to term limits. For 10 points—name this Russian president.

answer: Vladimir Putin

4. Georg Hegel's teaching was compiled into "Lectures on the Philosophy" of this academic subject. Francis Fukuyama claimed it was ending due to the triumph of democracy. People known for writing in this academic field include Edward Gibbon, Stephen Ambrose, and David McCullough. (*) Herodotus is often called the father of it, and Thomas Carlyle said it is largely explained by "great men" who impacted its course. For 10 points—give this study of past events.

answer: history

5. Maria Karnilova and Zero Mostel won 1965 Tonys for appearing in this musical whose name is derived from a Marc Chagall painting. Jerome Robbins attended weddings to research what became the "Bottle Dance" near the end of its first act. In a song of this musical, a man would use wealth to get a seat by the Eastern Wall. It includes (*) "Matchmaker, Matchmaker" and "Tradition" in addition to "If I Were a Rich Man". Tevye [TEV-yah], a Russian Jew, is the main character of—for 10 points—what musical featuring a musician above the ceiling?

answer: Fiddler on the Roof

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6. In the 17th century this country was explored by Bandeirantes [ban-DARE-ee-RAHN-tays], who were gold-seeking adventurers including Domingos Jorge Velho. This country's coast includes the lands east of the Tordesillas [torr-day-SILL-us] Line of 1494. In its early history, this country became the world's largest exporter of (*) sugar, a status it has again today. Emperor Pedro II [the second] ran this country that seized territory from Paraguay in an 1860s war. The world's 9th-largest economy is—for 10 points—what country that comprises just under half of South America's land?

answer: Federative Republic of Brazil or República Federativa do Brasil

7. One reaction takes this compound and hydrogen and produces methanol and water. Vincent Schaefer dropped the solid form of this compound into clouds over Mount Greylock to induce snow. This compound with a molar mass of 44 grams is captured and sold by Christoph Gebald and Jan Wurzbacher's company (*) Climeworks to local Swiss greenhouses. The primary component of Venus's atmosphere, this compound is responsible for soft drink fizz. For 10 points—give this gas humans exhale, whose chemical formula is CO₂.

answer: carbon dioxide (accept CO₂ before given; accept dry ice after "Vincent")

8. Wilfred Owen's poem "Anthem for Doomed Youth" concerns participants of this historical event. Dalton Trumbo's book *Johnny Got His Gun* is set during this event which Boris Pasternak describes when Doctor Zhivago works in a Meliuzeevo [MEL-ee-oh-ZEE-voh] hospital. Michael Morpurgo wrote a novel in which Tophthorn and Joey are (*) horses who participate in this conflict. The German author Erich Maria Remarque served in this conflict and set a tale of Paul Bäumer during it. *All Quiet on The Western Front* takes place during—for 10 points—what war that ended in 1918?

answer: World War I (prompt on the "Great War")

9. Claude-Paul Taffanel founded a school for this instrument that Louis Lot was known for manufacturing. A soloist uses this device in both Georg Telemann's *12 Fantasias* and Claude Debussy's *Syrinx* [SEAR-inks]. Though it was adapted to clarinets and oboes, the interlinking rods of the (*) Boehm System originally applied to this instrument. It names a family of instruments including the fife, piccolo, and recorder. For 10 points—give this wind instrument consisting of a tube and finger holes or keys.

answer: flute

10. The two people who served as governor of this area were Arthur St. Clair and Charles Willing Byrd. Rufus Putnam led The Forty-Eight, who created this region's first settlement of Marietta. Connecticut and Massachusetts ceded claims to land here before the (*) Confederation Congress created this region in an 1787 Ordinance. Its land eventually became six states including Indiana and Wisconsin. For 10 points—give this territory named for its direction with respect to the Ohio River.

answer: Northwest Territory (accept Northwest Ordinance after "Confederation Congress")

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11. **Māoris believe that Māui eliminated these from the world and then visited Mahuika to obtain new ones. In Chinese myth Hui Lu could create one of these by letting one hundred birds out of a gourd. In Zoroastrianism, Atar is a holy one of these symbols of purity. To honor (*) Agni, the bride and groom walk around one seven times in Hindu weddings. In Fijian mythology Gedi taught humans to use this, similar to the Greek story of Prometheus. For 10 points—give this luminous result that appears during the cremation of the dead.**

answer: **fire or flame**

12. **One species of these organisms in the genus *Halomonas* was discovered in the *Titanic* wreckage. The Luria–Delbrück experiment described their random adaptations. Those with a thick layer of peptidoglycan turn violet in a classification technique developed by Hans Christian (*) Gram. To survive desiccation or harmful chemicals, these small entities can form endospore structures for protection. Cholera, anthrax, and leprosy are all caused by—for 10 points—what microorganisms with rod or spherical shapes?**

answer: **bacteria**

13. **Participants of this activity stopped a naked woman from vandalizing St. Luke's Church in Connecticut. Two men walked over an Encinitas, California cliff while doing this activity. A JAMA Internal Medicine study estimated this activity caused thousands of distracted driving incidents in July 2016. Its participants have to go outside of (*) North America to obtain three of its species, the rare Kangaskhan, Farfetch'd, and Mr. Mime. For 10 points—name this augmented reality game played on mobile devices which involves gym-trained creatures.**

answer: **Pokémon Go** (prompt on partial answers)

14. **Mathematical operations have this property when the result is always in the same set as the operands. This term describes curves in the plane with no endpoints that completely surround an area. When referring to circuits, this term means a complete (*) path over which electricity can flow. Finite intervals that include both endpoints are known by this term and denoted with square brackets. For 10 points—give this term that can describe something with a barrier, such as a gate or locked door.**

answer: **closed** (accept word forms including **closure**)

15. **This country's writers Finuala Dowling and Sheila Fugard have won its Olive Schreiner Prize. J.R.R. Tolkien was born in what is now this country whose Nobel laureates include J.M. Coetzee [coh-EE-zee]. One work set here in which Stephen Kumalo's son is arrested for murder is titled *Cry, the Beloved Country*. Another novel set in this country shows (*) Bamford Smales' white family fleeing during a civil war and is named *July's People* after the family's black servant. For 10 points—name this country where Nadine Gordimer and Alan Paton described its apartheid government.**

answer: Republic of **South Africa**

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16. **The Shockley-Queisser formula gives efficiency goals of these devices, one of which Charles Fitts invented by coating selenium with gold. Like the trend of computer processors, Swanson's law says these devices' prices have halved every ten years. A gallium arsenide semiconductor was used in the ones of these on the rovers (*) *Spirit* and *Opportunity*. Dow chemical formerly integrated them into roof shingles. About one percent of current U.S. energy consumption is generated by—for 10 points—what devices that won't produce much electricity in a dark room?**

answer: **photovoltaic** cells (or system) or **solar cells** (accept **solar panels** or **solar battery**; prompt on "solar power")

17. **This is the object at the center of René Magritte's [mah-GREETS] *The Seducer*. One of these appears just above Icarus's legs in a Pieter Bruegel the Elder landscape. Another with the word *Gloucester* on it is used by boys in Winslow Homer's *Breezing Up*, and Homer also showed two men using a positioning (*) sextant on one of these in *Eight Bells*. Some people on one attempt a rescue in John Singleton Copley's *Watson and the Shark*. For 10 points—name this mode of transportation also in Caspar David Friedrich's *Moonlight by the Sea*.**

answer: **ship** or (sail)**boat** or **raft** or **watercraft** (accept any synonym for these answers used to traverse water)

18. **Axel Oxenstierna was one statesman who helped this country build a 17th-century empire whose royals lived in Castle Tre Kronor. The House of Bernadotte currently reigns in this country that was the home of U.N. Secretary General Dag Hammarskjöld. The Treaty of Nystad between this country and (*) Russia ended the Great Northern War, and this country had to surrender its Finnish possessions in 1809. Stockholm is the capital of—for 10 points—what country to the west of Norway?**

answer: Kingdom of **Sweden** or Konungariket **Sverige**

19. **In a drama by this writer, the Reverend T. Lawrence Shannon is accused of having an affair with an underage girl during a Mexican tour. The schizophrenia of his sister Rose inspired a play by this author in which a gentleman caller discusses with Laura Wingfield a collection of (*) tabletop figurines. He also authored a drama in which the New Orleans resident Stanley Kowalski clashes with his sister-in-law Blanche DuBois. For 10 points—give this author of *The Glass Menagerie* and *A Streetcar Named Desire*, a man whose nickname is a southeastern state.**

answer: Tennessee **Williams** or Thomas Lanier **Williams** III

20. **Lentulus Batiatus owned a place where these people learned their assignment. A veteran one of these no longer required to participate was a *ridiarius*. One of these from Thrace escaped and led a side of the Third Servile War. The *cestus* type had no (*) armor while the *essedarius* was permitted use of a chariot. The crowd passed judgement on these people with the *pollice verso*, and defeated ones getting the thumbs down were condemned to death. For 10 points—give the term for these ancient Roman fighters.**

answer: **gladiators**

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21. **One character in this book is said to smell like sage and lemongrass, and gets a spider tattoo. The protagonist of this book imagines glass is actually ice which then shatters. This novel's character Uriah invites the protagonist to jump off a train and (*) zipline down a skyscraper.** The title of this novel is the category of people with inconclusive test results, as all citizens must be placed into one of five factions. Veronica Roth wrote—for 10 points—what novel followed by *Insurgent* and *Allegiant*?

answer: **Divergent**

22. **Engineers involved in this project included John Findley Wallace and John Frank Stevens. One early attempt to set its parameters was the 1850 Hay–Pauncefote Treaty, but it proceeded in earnest after the 1903 Hay–Bunau-Varilla Treaty. Overflows of Lago Alajuela [ah-lah-HWAY -lah] can cause its (*) closure and people using this project also pass through Gatun Lake.** For 10 points—name this artificial waterway allowing travel between the Atlantic and Pacific through a Central American isthmus.

answer: **Panama Canal** (accept **Panama Canal Zone**)

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Bonuses

1. In the third part of this work Amir adopts the boy Sohrab. For 10 points each—

A. Name this Khaled Hosseini novel titled for a boy who retrieves toys defeated in aerial combat.

answer: The **Kite Runner**

B. The beginning of *The Kite Runner* is set in what Asian country whose cities include Kandahar and Kabul?

answer: Islamic Republic of **Afghanistan**

C. The character Hassan is killed trying to prevent this group from confiscating a house. This group enforced Islamic law when they controlled Afghanistan in the late 1990s.

answer: **Taliban** (prompt on "Islamic Emirate of Afghanistan")

2. One deity in this people's mythology is Nanook, who had dominion over bears. For 10 points each—

A. Give this term for aboriginal peoples of Greenland, Canada, and Alaska, a name more inclusive than "Eskimo".

answer: **Inuit**

B. The Inuit are the majority group in this Canadian territory whose capital is Iqaluit [ee-KWAL-you-it]. It separated from the Northwest Territories in 1999.

answer: **Nunavut**

C. The Dorset and Thule were two Inuit groups who interacted with the descendants of this Norseman who founded a Greenland colony in 985. This Viking had brightly-colored hair.

answer: **Erik the Red** (prompt on "Erik")

3. For 10 points each--give these answers related to mathematicians in film:

A. Katherine Johnson and Dorothy Vaughan were among the women who calculated rocket trajectories while employed by this organization in the film *Hidden Figures*.

answer: **NASA** or the **National Aeronautics and Space Administration**

B. Jeff Goldblum portrayed Dr. Ian Malcolm in this 1993 film. The doctor uses tiny imperfections in Ellie Sattler's hand to explain chaos theory and also criticizes John Hammond's bioengineering.

answer: **Jurassic Park**

C. *The Imitation Game* told the story of this Englishman who designed an early computer to crack the Enigma codes. A theoretical machine named for him performs computations on a paper infinite in size.

answer: Alan **Turing**

4. For 10 points each—give these answers related to musical chords:

A. A chord can consist of this interval, which is a note and another with half or double its frequency. For example, middle C and the C above it.

answer: (perfect) **octave** or (perfect) **eighth**

B. Chords in which notes are lowered are called diminished, while in this type of chord the top note is raised. An example is C, E, G sharp.

answer: **augmented** chord (accept **augmented** fifth)

C. The distinctive "Tristan Chord" of F, B, D sharp, G sharp comes from this composer's *Tristan and Isolde*. "The Ride of the Valkyries" is part of his Ring Cycle.

answer: (Wilhelm) Richard **Wagner** [VAHG-ner]

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5. For 10 points each—give these answers related to plate tectonics:

A. Places where continental plates meet can see orogeny [oh-RAH-gen-KNEE], where the fold examples of these geologic structures are created. The Zagros examples of these objects continue to be pushed higher.

answer: **mountains**

B. This transform fault in California is where two plates grind together. This earthquake source has a Spanish name honoring one of Jesus's disciples.

answer: **San Andreas** fault [which means Saint Andrew]

C. The Pacific Plate is being subducted at this deepest part of the world's oceans. The Challenger Deep is in the southern end of this region.

answer: **Mariana Trench** or **Marianas Trench**

6. Elon Musk called this proposal the fifth mode of transportation. For 10 points each—

A. Give this nine-letter term for a conveyance that will accelerate a pod-like vehicle in a reduced-pressure tube.

answer: **Hyperloop**

B. The Hyperloop is one initiative by this Musk corporation that sent the Dragon rocket to the station in low-Earth orbit.

answer: **SpaceX** or **Space Exploration Technologies** Corporation

C. The Hyperloop's proposed velocity is near this value on a ratio scale named for an Austrian physicist. It is approximately 767 miles per hour and objects exceeding it can produce a sonic boom .

answer: **Mach 1** (prompt on partial answers and on "speed of sound")

7. In 2015 Virginia made it a misdemeanor to have this symbol on license plates. For 10 points each—

A. Name this symbol designed by Nicola Marschall. It flew over a capital at Richmond until an 1865 surrender.

answer: **Confederate flag** or **Stars and Bars** (accept variants like the **battle flag** of the **Confederate** States of America)

B. Following the Emanuel African Methodist Episcopal Church shooting, this South Carolina governor called for the flag's removal. She is now the U.S. ambassador to the United Nations.

answer: (Nimrata) Nikki **Haley**

C. In 2016 this largest Protestant body in the U.S. voted to stop displaying the flag in churches. Billy Graham was ordained by this denomination with a cardinal direction in its name.

answer: **SBC** or **Southern Baptist** Convention (prompt on "Baptist")

8. He was the third son of John, the founder of the House of Aviz. For 10 points each—

A. Name this royal figure who led a 1437 force that failed to capture Tangier. He also organized several expeditions to explore Africa's west coast.

answer: Prince **Henry** the Navigator or **Henrique** of Portugal, Duke of Viseu

B. Prince Henry the Navigator lived in this country later ruled by the house of Braganza. Its occupies the western portion of the Iberian peninsula.

answer: Kingdom of **Portugal** or Reino de **Portugal**

C. During Henry's time, the Portuguese explored and settled this archipelago of north Atlantic islands, whose land masses include São Miguel and Terceira.

answer: The **Azores** or Autonomous Region of the **Azores**

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9. A deficiency of this compound can cause night blindness. For 10 points each—

A. Name this vitamin the body creates from molecules of beta-carotene.

answer: vitamin **A** (accept **retinol**, **retinal**, or **retinoic acid**)

B. The human version of this organ can store a year's supply of vitamin A. Diseases that affect this organ include hepatitis and cirrhosis.

answer: **liver**

C. Vitamin A is essential for the function of this type of white blood cell. Hodgkin's disease starts in these cells, a category that includes the B and T cells which fight infection and are found in namesake nodes.

answer: **lymphocytes** (prompt on "lymph node") [Hodgkin's is also called Hodgkin's lymphoma]

10. At this island's north is the Point of Ayre. For 10 points each—

A. Name this island of the Irish Sea whose capital is Douglas. This Crown dependency claims the world's oldest parliament in continuous existence, the Tynwald.

answer: Isle of **Man**

B. The language Manx is part of this language group that includes modern Irish and the Celtic language spoken in Scotland. In myth these people are descended from Goidel Glas.

answer: **Gaelic** languages (prompt on "Goidelic languages")

C. The Crown dependencies are the Isle of Man as well as these islands including Guernsey and Jersey. Their name reflects the body of water they inhabit south of England.

answer: **Channel** Islands (the **English Channel** Islands is acceptable)

11. The 2015 novel *Go Set a Watchman* shares characters with this work. For 10 points each—

A. Name this novel in which Atticus Finch defends Tom Robinson after Tom is accused of rape.

answer: **To Kill a Mockingbird**

B. *To Kill a Mockingbird* is by what author who published the essay "When Children Discover America" for *McCall's* magazine?

answer: Harper **Lee**

C. Harper Lee helped Truman Capote interview Kansas residents for this nonfiction novel about the murder of Herbert Clutter and his family.

answer: **In Cold Blood**

12. The phrase "Kilroy was here" was popular in the examples of these drawings created by American servicemen. For 10 points each—

A. Give this term derived from Italian for "scratched", referring to sketched words or elaborate paintings that can illegally decorate public property.

answer: **graffito** or **graffiti**

B. The identity of this England-based graffiti artist is unknown. He depicted Steve Jobs in *The Son of a Migrant from Syria*, a mural at the Calais refugee camp.

answer: **Banksy**

C. Banksy drew a dove wearing a bulletproof vest in one work in this territory and a girl frisking a soldier in another. Israel built a much-graffitied wall on its border with this region whose cities include Ramallah and Hebron.

answer: **West Bank** (prompt on "Palestinian territories" or "Palestine")

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13. This man labels the proletariat as the social class that sells its labor for a wage. For 10 points each—

A. Name this figure who wrote *The Communist Manifesto* with Friedrich Engels.

answer: Karl **Marx**

B. The International Workingmen's Association was an attempt to unite Marxists with this other political movement. These movements are generally against strong states and advocate limited or even no government.

answer: **anarchist** (accept word forms)

C. Marxism shares some goals with this other philosophy about maximizing political freedom. In the 2016 U.S. election Gary Johnson represented a party with this name.

answer: **libertarian**(ism)

14. After the Great Mississippi Flood of 1927 this group was charged with building river levees to protect cities. For 10 points each—

A. Name this construction management agency run by the Department of Defense, whose current head is Todd Semonite.

answer: **Army Corps** of Engineers (prompt on "USACE" or "CoE")

B. In its early days, the superintendent of this cadet school was an Engineer. Most graduates of this New York school are commissioned as second lieutenants.

answer: **West Point** or **United States Military Academy** or **USMA**

C. Major General Leslie Groves was a Corps officer who oversaw this project that employed physicist Robert Oppenheimer. This project conducted the 1945 Trinity test in the remote New Mexico desert to assess its product.

answer: **Manhattan** Project

15. This product's average dose price of \$284 caused a 2016 controversy, and the product was recalled in 2017 over faulty activation reports. For 10 points each—

A. Name this Mylan NV product used by people with life-threatening allergies.

answer: **EpiPen**

B. Epinephrine, also called adrenaline, plays a role in this alliteratively-named physiological reaction to danger. Walter Bradford Cannon coined this three-word term.

answer: **fight or flight**

C. Sometimes called the "stress hormone," Cushing's syndrome is overproduction of this other product of the adrenal glands. It initially helps the body produce glucose and increases appetite.

answer: **cortisol**

16. Shortly after the Diwali holiday, this country's prime minister announced the 500- and 1000-rupee banknotes were being removed from circulation to combat corruption. For 10 points each—

A. Name this country where many banks are headquartered in Mumbai.

answer: Republic of **India** or **Bhārat** Gaṇarājya

B. This Indian prime minister, the successor of Manmohan Singh, issued the decree.

answer: Narendra **Modi**

C. The term "rupee" means a "coin of silver" in what language used for ancient texts including the Yoga sutras of Patanjali?

answer: **Sanskrit** or **Samskr̥tam**

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17. A key moment in this novel is when Gene Forrester shakes a tree branch, which causes Finny to fall and break a leg. For 10 points each—

A. Name this John Knowles work set at the Devon prep school.

answer: A **Separate Peace**

B. “A Separate Peace” was a proposed, but not used title for this novel in which Frederick Henry falls in love with Catherine Barkley during the World War I Italian campaign.

answer: A **Farewell to Arms**

C. *A Farewell to Arms* is by what American author of *The Sun Also Rises* and *The Old Man and the Sea*?

answer: Ernest **Hemingway**

18. In 1963 a committee was formed to investigate the JFK assassination. For 10 points each—

A. The Commission is commonly named for this Chief Justice who headed it. He served on the court until 1969.

answer: Earl **Warren** (accept **Warren Commission**)

B. The Commission concluded Kennedy was assassinated by this man who had previously defected to the Soviet Union. Jack Ruby killed him as he was being moved to a jail.

answer: Lee Harvey **Oswald**

C. One Michigan member of the commission was this House Minority Leader, who later ascended to other posts upon the resignations of others.

answer: Gerald **Ford** (or Leslie Lynch **King**, Jr.)

19. For 10 points—give these names common to astronomy and mythology:

A. Markab and Scheat are among the stars in this constellation said to resemble a mythological winged horse.

answer: **Pegasus**

B. Rigel and Betelgeuse are in this constellation with shoulders, feet, and a belt. In one myth this figure loved a princess of Chios named Merope [mer-OH-pee].

answer: **Orion**

C. John Goodricke studied the delta star of this constellation and described its varying luminosity. In myth this husband of Cassiopeia was an Ethiopian king.

answer: **Cepheus** [the stars are known as Cepheid variables]

20. This country was led by Hugo Chávez until his 2013 death. For 10 points each—

A. Name this South American country currently suffering an economic depression.

answer: Bolivarian Republic of **Venezuela** or República Bolivariana de **Venezuela**

B. Venezuela’s lack of goods has raised this economic indicator to levels above 700 percent. This general increase in prices has cost-push and demand-pull varieties.

answer: **inflation** (accept **hyperinflation**)

C. Ecuador and Venezuela are the two western hemisphere members of this organization that coordinates policies among oil producers.

answer: **OPEC** or **Organization of the Petroleum Exporting Countries**

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21. This author described Senator Buzz Windrip, who wins a presidential election by playing on people's fear of foreigners and promising economic reform in the novel *It Can't Happen Here*. For 10 points each—

A. Name this author of *Elmer Gantry* and *Arrowsmith*.

answer: Sinclair **Lewis**

B. Lewis's best known work may be this 1922 novel about a successful real estate agent whose first name is George. At the end of the work his son Ted hastily marries Eunice.

answer: **Babbitt**

C. Carol Kennicott has trouble adapting to the small town of Gopher Prairie, Minnesota in this Lewis novel named for an important road in many cities.

answer: **Main Street**

22. The secant is this operation's reciprocal. For 10 points each—

A. Give this trigonometric operation equal to the adjacent side divided by a hypotenuse of a right triangle.

answer: **cosine**

B. One definition of this operation is that for vectors "a" and "b" this equals the magnitude of "a" times the magnitude of "b" times the cosine of the angle between the vectors. This operation's result is a scalar number.

answer: **dot product**

C. A formula named for this mathematician states that "e" to the "i" times "x" equals cosine "x" plus "i" times sine "x". The constant "e" is sometimes called his number.

answer: Leonhard **Euler** [OY-ler]