

2020 Reinstein Set – Packet 12

Tossups

1. The smallest one of these shapes to circumscribe a given triangle is named for Jakob Steiner and is centered at the triangle's centroid. A two-variable quadratic expression generates this shape if the xy coefficient squared, minus 4 times the x -squared coefficient times the y -squared coefficient, gives a negative value. This shape is formed by all the points that are half as far from a fixed point as they are from a fixed line. It is also formed by all the points for which the *sum* of the distance to two fixed points is constant; those points are called **foci** ["FOE-sigh"]. Name this conic section that can be formed by stretching a circle.

Answer: **ellipse**

2. This person, who never became president, told Charles **Guiteau** [gee-toh] "Never speak to me again of the Paris consulship as long as you live." This person was very nearby when Guiteau assassinated President Garfield. A few months later, this person resigned his position as Secretary of State, though he returned to the job under President Benjamin Harrison. This person did not get along well with Chester Arthur and other Stalwarts; this person's supporters were called Half-Breeds. One of the Republicans who opposed this politician was Roscoe Conkling. Name this person who lost the election of 1884 to Grover Cleveland and who was from Maine.

Answer: James G. **Blaine**

3. These objects are maintained by an enzyme named for them and shelterin: TERRA and the CST Complex. Elizabeth Blackburn, Carol Greider, and Jack Szostak shared a Nobel Prize studying the functions of these objects and their enzyme. These objects get too small at the Hayflick limit. Recent research suggests a relationship between the shortening rate of these objects and the lifespan of an organism. When these structures get too small, cells stop dividing and sometimes initiate **apoptosis** [ay-"pop"-TOH-siss]. Name these repetitive nucleotide sequences at the ends of chromosomes.

Answer: **telomeres** [**TELL-oh-meerz**]

4. In one book by this writer, an Indian servant named Santosh marries an African-American woman to gain citizenship. That story, “One out of Many”, is included with “Tell Me Who to Kill”, travel journal excerpts, and a novella set in what seems to be Uganda [pause] in this author’s Booker Prize-winning book. In another novel by this writer, the protagonist becomes a sign-painter for the Tulsi family and marries Shama. This author wrote that that protagonist, named Mohun, was born with an extra finger. Name this author of *In a Free State* and *A House for Mr. Biswas* who was born in Trinidad and Tobago.

Answer: V(idiadhara) S(urajprasad) (“Vidia”) **Naipaul**

5. Towards the end of this person’s life, he translated books and worked as a mechanic using the last name “Shaw”. This person was tortured as a prisoner after being captured in Dera’a [DEER-ah-ah] before helping plan an attack on Damascus. Early in this person’s career, after working briefly as an archaeologist, he worked for the person who would become Faisal I of Iraq in an attempt to free territory from control by the Ottoman Empire. After this person refused George V’s attempt to make him a knight, he named his motorcycle “George V”. Name this Englishman who wrote *Seven Pillars of Wisdom* and tried to unify Saudi Arabia.

Answer: T(homas) E(dward) **Lawrence** or **Lawrence** of Arabia

6. Joseph von Fraunhofer labelled seven prominent examples of these things using the letters ‘A’ through ‘G’. These things are widened because of thermal Doppler broadening. The most important examples of these things for hydrogen are in series named for Brackett, Paschen, Balmer, and Lyman. The study of these things led to an initial value for the Rydberg constant. These things are split by an electric field in the Stark effect and by a magnetic field in the Zeeman [ZAY-mun] effect. Name these things that are used to identify the presence of elements when viewed through a diffraction grating and that are often emission lines.

Answer: **spectral** lines or emission **spectrums** or emission **spectra** [or **absorption** lines; accept **emission** lines before “emission”]

7. This opera's aria "In quegli anni" [een KWAY-yee AH-nee] is sung by a music teacher, though that number is dropped from some productions to shorten the fourth act. One character in this opera sings "Non so piú cosa son" and "Voi che sapete" [voy kay sah-PEH-tay]. That character, who announces that he is infatuated with all women and is later taught to act like a woman, is Cherubino ["care"-oo-BEE-noh]. During this opera, the Count believes that he is having an affair with Susanna, who is actually his wife in disguise. Name this opera by Mozart that has many of the same characters as Gioachino Rossini's [joh-ah-KEE-noh roh-SEE-nee'z] *The Barber of Seville*.

Answer: *The Marriage of Figaro* [or *Le nozze di Figaro*]

8. Some of these texts are classified as "mursal" because the proof of their chain of transmission is weak, in terms of the isnads [iz-NODZ] that attest to their authenticity. These texts are classified as mawdu [maw-DOO] if they are determined to be untrue. Six of the books containing these texts are collectively called Kutub al-Sittah [koo-TUB ahl SIT-tuh]. One of these texts states that people can enter Paradise if they believe in the 99 names of God. Another of these texts states the Six Articles of Faith. These texts are sometimes viewed as documentations of practices called sunnah [SOON-uh]. Name these texts that tell of the words and actions of Muhammad.

Answer: hadiths [accept isnad before it is mentioned]

9. In one novel set in this country, a woman poisons her husband, but her son Jaja takes responsibility for it. The same author wrote a novel about people who re-unite in this country. In that novel, a man marries Kosi after returning from England, and a woman starts a blog called "Raceteenth". Another writer from this country wrote a play about a westernized teacher and a traditional village chief, both of whom are interested in a woman named Sidi [SEE-dee]. Name this country that is the setting for *Purple Hibiscus* and *Americanah* by Chimamanda Ngozi Adichie [chim-ah-MAN-duh en-GOH-zee ah-DEE-chee] [pause] and *The Lion and the Jewel* by Wole Soyinka [woh-LAY soh-YEEN-kuh].

Answer: (Federal Republic of) Nigeria

10. In 1966, this man led a march from **Delano** [duh-LAY-noh] to Sacramento, California in support of an action that was started by Filipino-Americans. Just before starting to run for president, Robert Kennedy flew to California to be present at the end of one of this man's hunger strikes. This person often worked closely with Dolores Huerta, with whom he co-founded the National Farm Workers Association, which became the United Farm Workers. This person encouraged Americans to boycott grapes, and he popularized the phrase "**Sí se puede**" [see say pway-day] decades before President Obama used it. Name this Latino American labor leader.

Answer: Cesar **Chavez**

11. The bacteria that cause this disease can be cultured in Regan-Lowe agar, which has replaced **Bordet-Gengou** [bor-day zhen-goo] agar. The bacteria is in the *Bordetella* genus. This disease goes through **catarrhal** [kuh-TAR-ull], **paroxysmal** [puh-"ROCKS"-iss-mull], and convalescent phases. This disease releases **tracheal cytotoxin** [TRAY-kee-ull "sight-oh-toxin"], which is one way that it induces vomiting. Because the whole-cell vaccine for this disease had more side effects, the **a-cellular** [ay-"cellular"] form is now more common. This bacterial disease is characterized by an inward breath following a severe coughing spell. Name this disease whose vaccine is often combined with those for diphtheria and tetanus.

Answer: **pertussis** or **whooping cough**

12. This country was divided into seven provinces in 2015, several of which have taken time to pick a name; the first name chosen was Karnali, whose capital is **Birendranagar** [bir-en-DRAH-nuh-gar]. Soldiers from this country use a curved knife called a *kukri* and are called Gurkhas; many of them are from the city of **Pokhara** [POH-kuh-rah]. **Sagarmatha** [sah-gahr-MAH-thuh] National Park is in the eastern part of this country. **Lumbini** [loom-BEE-nee], the birthplace of Buddha, is in this country. The Indian state of **Sikkim** [seek-KEEM] separates this country from Bhutan. Name this country between India and Tibet in the Himalayan mountains, whose capital is **Kathmandu** ["cat-man-do"].

Answer: (Federal Democratic Republic of) **Nepal** [or (Sanghiya Lokatantrik Ganatantra) **Nepal**]

13. A controversial study that credited this molecule for doubling lifespan is called the **Baati [BAH-tee]** Rat Study. Though this molecule is extremely rare in nature, it does occur in small trace amounts in the mineraloid shungite. **Sumio Ijima [soo-mee-oh ee-jee-mah]** discovered multi-shelled varieties of this molecule, which are called “onion-like”. This molecule has over 12,000 resonance structures. This molecule consists of pentagonal rings surrounded by hexagonal rings. Name this **allotrope [AL-oh-“trope”]** of carbon with 60 atoms per molecule and whose name reflects its similarity to geodesic domes.

Answer: buckminster**fullerene** [accept **buckyballs**]

14. The oldest temple in this city is dedicated to the **bodhisattva [boh-dee-SAHT-vuh]** Kannon, is entered through the Thunder Gate, and was built in the seventh century. A tower that opened in 2012 in this city is the tallest tower in the world and, other than the Burj Khalifa, the tallest structure. That tower is this city’s Skytree. Another tower in this city is painted white and orange but shaped like the Eiffel Tower. This city’s Imperial Hotel was designed by Frank Lloyd Wright, though little remains of his work. Name this capital city whose National Diet Building houses the national legislature and was designed by **Watanabe Fukuzo [wah-tah-nah-bay foo-koo-zoh]**.

Answer: **Tokyo**, Japan

15. This author started one novel with the protagonist on the wrong train, thinking he is going to Cremona. This author’s protagonist in that novel teaches at Waindell College even though it has few Russian students. At the end of the short first chapter of another novel by this author, the protagonist writes “Look at this tangle of thorns.” That novel is supposedly based on *The Confession of a White Widowed Male*. In that novel, this author portrays a protagonist who had a relationship with Annabel Leigh and then goes after Dolores Haze. Name this author of *Pnin* who wrote about Humbert Humbert in *Lolita*.

Answer: Vladimir (Vladimirovich) **Nabokov [nah-BOH-kawf]**

16. The Praetorian prefect Macro helped this emperor come to power, but this leader criticized Macro until Macro committed suicide. An attempt to kill this emperor was called the Plot of the Three Daggers. After that plot, this emperor had two of his in-laws and his cousin Tiberius Gemellus [geh-MEL-loos] killed and had his sisters Livilla [liv-ILL-uh] and Agrippina [ag-rip-EE-nuh] the Younger exiled. This emperor succeeded Tiberius and was replaced by Claudius after being assassinated in 41 CE. Historians were very critical of this emperor, especially for the three years after his illness. Name this emperor who, according to legend, tried to make his horse Incitatus [in-kih-TAH-tuss] a consul.

Answer: Caligula [or Gaius Julius Caesar Augustus Germanicus or Gaius Caesar Germanicus; prompt on Gaius Caesar but do not accept or prompt on other parts of the name]

17. This organization's employees Maggie Michael, Maad al-Zikry and Nariman [nah-ree-MAHN] El-Mofly won awards for their recent work in Yemen. The concept of "quasi-property" was given Supreme Court backing when this organization won the *I.N.S.* case. Moses Yale Beach started this organization, after having worked at *The Sun*, to improve information-gathering during the Mexican-American War. This organization had a major rivalry with UPI, but since the UPI is now smaller, this organization's biggest rival is Reuters [ROY-turs]. Name this U.S. organization whose members are newspapers.

Answer: Associated Press or AP

18. In this novel, one of the characters discusses listening to the song "Twas rank and fame" with Richie Goulding while eating at the Ormond hotel. At the same time in this novel, Blazes Boylan is about to have an affair with that man's wife. The end of this novel is told from the point of view of the wife remembering their engagement; it says "His heart was going like mad and yes I said yes I will Yes." That wife, Molly, has many parallels with Penelope from *The Odyssey*. Name this stream-of-consciousness novel about Leopold Bloom that takes place in a single day and was written by James Joyce.

Answer: Ulysses

19. This person and Hendrik Lorentz are the namesakes of a pendulum that is shortened as it swings. This person and James Jeans proposed a model of radiation that predicted the emission of too much energy, which was called the ultraviolet catastrophe. Another phenomenon named for this person occurs when the ratio $2\pi r$ over λ is very small, where r represents the size of particles. The extent of that phenomenon is inversely proportional to the fourth power of the wavelength, and it is used to explain the color of the sky. Name this British scientist who, like C. V. Raman [RAH-mun], is the namesake of a kind of scattering.

Answer: (John William **Strutt**, 3rd Baron) Lord **Rayleigh** [accept either underlined name]

20. The aftermath of this leader ceding territory is described by the phrases “diplomatic revolution” and “reversal of alliances”, which is when this leader formed an alliance with France rather than England. That shift was overseen by this leader’s chancellor, Wenzel Anton von Kaunitz. That occurred after this person’s hold on the throne was strengthened by the War of the Austrian Succession, and this person was allowed to rule according to the Pragmatic Sanction of 1713. Name this Habsburg who was married to Holy Roman Emperor Francis I and who was the archduchess of Austria and queen of Hungary.

Answer: Maria **Theresa** (Walburga Amalia Christina) [or Maria **Theresia**]

21. This number appears in the Ramanujan-Nagell [rah-mah-NOO-jun nug-EL] equation because it is the only number that can be represented more than one way as the difference between a power of 2 and a perfect square. This is the fewest number of sides for a regular polygon that *cannot* be constructed with straightedge and compass, and it’s also the fewest number of sides of a regular polygon whose internal angles are not a whole number of degrees. This is the smallest positive integer whose reciprocal’s decimal expansion has a six-digit repeating pattern. If two standard dice are rolled, this is the most likely sum. Give this number of sides of a heptagon.

Answer: 7

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Bonuses

1. This composer's *Octet in E-flat major for Strings*, which he wrote at age 16, is still performed.

A. Name this German composer whose tour of Europe resulted in his 3rd Symphony being nicknamed *Scottish* and his 4th Symphony being nicknamed *Italian*.

Answer: (Jakob Felix) **Mendelssohn**(-Bartholdy)

B. Mendelssohn's "Wedding March" comes from incidental music he wrote for this play.

Answer: *A **Midsummer Night's Dream***

C. Give the first name of Felix Mendelssohn's older sister, who composed *Das Jahr* [dahss yar] and sometimes published works under his name.

Answer: **Fanny** Mendelssohn Hensel

2. This quantity is plotted on the y -axis of the Hertzsprung-Russell diagram.

A. Name this quantity that is synonymous with absolute brightness and can be used to find absolute magnitude.

Answer: **luminosity**

B. The known star with the highest luminosity is in this galaxy near the Milky Way that is connected to a smaller galaxy by a bridge of gas.

Answer: **Large Magellanic Cloud** [accept **LMC**]

C. That hypergiant star, R136a1, is this type of star that can be further classified as "WN" or "WC".

Answer: **Wolf-Rayet** star

3. The mother of this novel's protagonist becomes a famous feminist when she writes the book *A Sexual Suspect*.

A. Name this novel about a writer who marries Helen, the daughter of his high school wrestling coach. Their family is injured in a car accident.

Answer: *The **World According to Garp***

B. *The World According to Garp* was written by this author, as was *The Cider House Rules*.

Answer: John (Winslow) **Irving** [or John Wallace **Blunt** Jr.]

C. In this novel by John Irving, a short person dies saving Vietnamese children.

Answer: *A **Prayer for Owen Meany***

4. This psychologist described a pyramid whose bottom level is labeled “physiological” and includes concepts like breathing and food.

A. Name this person who put those physiological considerations on the bottom of his hierarchy of needs.

Answer: Abraham (Harold) **Maslow** [accept **Maslow**’s hierarchy of needs]

B. This is the highest level on the hierarchy of needs. It includes morality and creativity.

Answer: **self-actualization** [or **self-actualizing** or being **self-actualized**]

C. Maslow described his hierarchy in a paper titled “A Theory of Human” *this concept*. This same concept was used in the title of his book, where it was paired with “personality”.

Answer: **Motivation** [do not accept variations]

5. Shortly before becoming commander of the American Expeditionary Forces, John Pershing went on an unsuccessful mission to capture this person.

A. Name this Mexican revolutionary who commanded the Division of the North.

Answer: (Francisco) “Pancho” **Villa** [VEE-yah] [or José Doroteo **Arango** Arámbula]

B. Pancho Villa was allied with this revolutionary who controlled **Morelos** [moh-RAY-lohss] in the south of Mexico.

Answer: Emiliano **Zapata** (Salazar)

C. General Pershing tried to capture Pancho Villa after Villa attacked this town in New Mexico.

Answer: **Columbus**, New Mexico

6. Answer the following about chemical weapons:

A. This yellow-green diatomic gas was used as a chemical weapon in World War I.

Answer: **chlorine** [accept **Cl₂**]

B. Mustard gas contains chlorine, carbon, hydrogen and this element. The combination of this element and hydrogen is responsible for the smell of rotting eggs.

Answer: **sulfur** [accept **S**]

C. Chlorine is present in almost all of this type of chemical weapons. They are named for the blisters they cause as a result of chemical burns.

Answer: **vessicants**

7. These features are often drawn as dashed lines, and are often found in relation to rational functions.

A. Give this term for a line that a function's graph approaches as a limit.

Answer: **asymptotes**

B. Find an equation for the oblique asymptote of the rational function “ y equals the quantity $2x$ squared minus $3x$ plus 5 , end quantity, all over the quantity x plus 1 ”. Use slope-intercept form.

Answer: **$y = 2x - 5$** [or **$y = 2x + -5$**]

C. Find the slope of either asymptote of the hyperbola generated by the equation “ x squared over 16 , minus y squared over 9 , equals 1 ”.

Answer: **$3/4$** or **$-3/4$** [accept **$\pm 3/4$** ; accept **0.75** or **-0.75** or **± 0.75**]

8. Some of this novel is set in Doc's poolroom, where the protagonist plans a robbery with Gus, G. H., and Jack.

A. Name this novel in which the protagonist kills and decapitates Mary Dalton.

Answer: ***Native Son***

B. In *Native Son*, what object does Bigger Thomas use to kill Mary Dalton?

Answer: a **pillow**

C. This author wrote *Native Son* and the collection *Uncle Tom's Children*.

Answer: Richard (Nathaniel) **Wright**

9. The so-called “integers” named for this person are actually complex numbers in which the real and imaginary parts are both integers.

A. Identify this mathematician. A process named for him is used to put a matrix into row-echelon [ESH-uh-lahn] form.

Answer: (Johann) Carl (Friedrich) **Gauss** [rhymse with “house”] [prompt on **Gaussian**]

B. In simplified form, what Gaussian integer results when the quantity “ 3 plus i ” is divided by the quantity “ 1 plus i ”?

Answer: **$2 - i$** [or **$2 + -i$** or **$-i + 2$**]

C. Consider the matrix whose top row is “ $1, 1, 5$ ” and whose bottom row is “ $0, 1, 8$ ”. If the matrix is put in *reduced* row-echelon form, what number is in the top row, right column?

Answer: **-3** [do not prompt on “ 3 ”]

10. Identify these places where major floods took place:

A. Thousands of people in this state died in 1928 in the Okeechobee hurricane when a dike gave way. Some of the bodies were buried in a mass grave in West Palm Beach.

Answer: **Florida**

B. The deadliest hurricane in U.S. history was in 1900 when this resort city on an island was covered with about 10 feet of water.

Answer: **Galveston**, Texas

C. 2,000 people in and around this Pennsylvania town were killed in 1889 when a dam burst.

Answer: **Johnstown**, Pennsylvania

11. The protagonist of this novel lives at Tipton Grange with her sister Celia.

A. Name this novel named for the fictional town where it is set. The protagonist of this novel marries Reverend Edward **Casaubon** [kuh-SAW-bun] and Will Ladislaw.

Answer: **Middlemarch**

B. This author wrote *Middlemarch* about Dorothea Brooke [pause] roughly a decade after writing *The Mill on the Floss* and *Silas Marner*.

Answer: George **Eliot** [or Mary Ann **Evans**]

C. In *Middlemarch*, Nicholas Bulstrode has this job. He spends much of the novel trying to suppress information about his past.

Answer: **banker**

12. **Neutrophils** [NOO-troh-filz] and **lymphocytes** [LIM-foh-"sites"] are examples of this type of cell.

A. Name this type of blood cell that has a nucleus.

Answer: **white** blood cells [or **leukocytes**; accept **WBCs**]

B. These lymphocytes can react against cells without prior sensitization, which makes them the best defense against tumor cells.

Answer: natural **killer** cells [accept **NK** cells]

C. Natural killer cells and T cells interact with the Class 1 molecules named for this set of genes. In humans, the two molecule classes can be called the human leukocyte antigen.

Answer: **major histocompatibility complex** or **MHC**

13. This novel begins by discussing the idea of eternal return, saying that Nietzsche [NEET-chuh] called it the heaviest of burdens.

A. Name this novel about the surgeon Tomáš [toh-mahsh], who moves to the countryside with his wife Tereza and their dog Karenin.

Answer: *The Unbearable Lightness of Being* [or *Nesnesitelná lehkost bytí*]

B. This Czech author wrote *The Unbearable Lightness of Being*.

Answer: Milan **Kundera** [koon-DEH-rah]

C. In *The Unbearable Lightness of Being*, Sabina moves to this city, which she says she prefers to Palermo. The novel describes it as “a city of fountains large and small, of parks where music once rang out from the bandstands”.

Answer: **Geneva**, Switzerland

14. These nine goddesses were the daughters of Zeus and Mnemosyne [neh-MAH-suh-nee].

A. Name these goddesses that inspired people to write music and poetry.

Answer: **Muses**

B. Name the Muse of History, who was often portrayed with books.

Answer: **Clio**

C. Clio was punished for criticizing Aphrodite [af-roh-“DIE”-tee] when Aphrodite fell in love with this mortal.

Answer: **Adonis** [uh-DAH-niss]

15. Name these painters who portrayed weddings and related events.

A. This painter used a green dress that may signify wealth, hope, and fertility in his *Arnolfini Portrait*.

Answer: **Jan van Eyck** [yahn van “Ike”] [prompt on **Eyck**]

B. This painter placed the bride at the center of his *The Wedding Feast of Samson* and also painted *The Jewish Bride*. He is more famous for *The Night Watch*.

Answer: **Rembrandt** (Harmenszoon **van Rijn**) [accept either underlined portion]

C. This 16th-century Italian artist placed Jesus at the center of *The Wedding at Cana*.

Answer: Paolo **Veronese** [vair-oh-NAY-zay]

16. The protagonist of this novel tells **Adolphe** [ay-dolf] to read the first word of any verse of a Bible, demonstrating that he can recite the rest of the verse.

A. Name this novel in which Julien Sorel decides to become a soldier who seduces women, such as Madame de Renal, instead of becoming a priest.

Answer: *The **Red and the Black*** [or *Le **Rouge et le Noir***]

B. This author wrote *The Red and the Black*.

Answer: **Stendhal** [or Marie-Henri **Beyle**]

C. In Stendahl's novel *The Charterhouse of Parma*, Fabrizio del Dongo grows up in the castle of Grianta, which is next to what body of water?

Answer: Lake of **Como** [or Lago di **Como**]

17. This force deflects to the right in the northern hemisphere and to the left in the southern hemisphere.

A. Name this fictitious force in rotating reference frames.

Answer: **Coriolis** force or **Coriolis** effect

B. The magnitude of the Coriolis effect is found by multiplying this number times velocity times angular velocity times the sine of latitude.

Answer: **2**

C. This parameter equals the ratio of inertial force to Coriolis force. This number is large in a tornado.

Answer: **Rossby** number [or **Rossby** parameter or **Kibel** number]

18. After brief terms by Yuri Andropov and Konstantin Chernenko, this person became the leader of the Soviet Union.

A. Name this final Soviet leader who was in charge when several Eastern European countries became more independent.

Answer: Mikhail **Gorbachev**

B. Gorbachev promoted a policy of *perestroika*, which means “restructuring”, and this policy, whose Russian name means “openness”.

Answer: **glasnost**

C. Eduard **Shevardnadze** [shev-urd-NAHD-zhuh], who was Gorbachev's Minister of Foreign Affairs, became the leader of this country until its Rose Revolution.

Answer: **Georgia** [or **Sakartvelo**]

19. The Le Bel–van 't Hoff rule determines how many of these isomers can exist.

A. Give the term for any isomers that have the same molecular formula and sequence of bonded atoms, but different spatial arrangements.

Answer: **stereo-isomers** or **stereo-isomerism** [prompt on **spatial isomers** or **spatial isomerism**]

B. Give the two Latin prefixes for stereoisomers used to specify whether functional groups are on the same side of a molecule or opposite sides.

Answer: **cis** and **trans** [either order]

C. When there are more functional groups, a notation with these two letters is used to represent the way the groups are oriented.

Answer: **E-Z** notation [either order]

20. For any angle, this function squared equals 1 plus the tangent function squared.

A. Name this function that, for an acute angle in a right triangle, can be defined as “hypotenuse over adjacent”.

Answer: **secant** function [accept answers that additionally mention a variable; do not accept or prompt on “cosecant”]

B. Find the secant of the quantity “7 pi over 4”.

Answer: square **root** of **2** [accept **radical 2**]

C. If the secant of an acute angle is 4, then what is the tangent of the angle?

Answer: square **root** of **15** [accept **radical 15**]