

2018 Reinstein Set – Packet 2

Tossups

1. A series is conditionally convergent if applying this function to each term makes it divergent. To calculate the mean deviation, this function is applied to all the deviations before they are added and divided. The graph of this function is continuous over the real numbers and has a derivative of negative one for negative inputs, and positive one for positive inputs. Subtracting two numbers and applying this function gives the distance along the number line between the numbers. Applying this function is equivalent to squaring a number and then taking the square root. Name this function that never outputs a negative number.

Answer: **absolute value** [accept **magnitude** or **norm**]

2. The narrator of this play remembers a Lutheran professor who held class communes with **Erasmus** [uh-RASS-muss]. Putnam is accused of killing his neighbors for their land in this play, and he consults with a slave to conjure his dead infant children. In this play, a man under questioning remembers all of the commandments except the one prohibiting adultery. Abigail denies that Mercy danced naked in this play, but later confesses to seeing girls with the Devil. Near the beginning of this play, Reverend Parris becomes suspicious of the slave **Tituba** [TIT-choo-buh]. Name this play about Elizabeth and John Proctor, an allegory about the Salem witch trials by Arthur Miller.

Answer: *The **Crucible***

3. The change in this quantity during constant-pressure heating is equal to constant-pressure molar heat capacity times the natural log of the ratio of final and initial temperatures. J. Willard Gibbs defined this quantity as the opposite of the Boltzmann constant times the sum of probability times the natural log of probability for each microstate. This quantity's units are energy per temperature. This quantity remains constant in reversible processes. Name this quantity, represented by a capital *S*, that cannot decrease according to the second law of thermodynamics.

Answer: **entropy**

4. One of the holiest locations in this religion contains 125 shrines that are each rebuilt every 20 years. An incantation, a wand, and salt water are used in this religion's purification ceremonies, which generally precede all rituals. Practitioners of this religion sometimes use just water to cleanse their hands and mouth when entering a shrine after passing through a gate called a **torii** [tor-ee]. Many of this religion's shrines are dedicated to spirits called **kami** [kah-mee]. Name this religion that is often practiced alongside Buddhism and that became the state religion during the **Meiji** [may-jee] era in Japan.

Answer: **Shintoism** [or **kami-no-michi**]

5. The army from this location brought chains, which their enemy used on them, to the Battle of the Fetters. The army from this location used bribery to win the Battle of the Great Foss during the Second Messenian [meh-SEE-nee-un] War, and was badly defeated by Epaminondas [EP-uh-mih-NAHN-duss]—who fought for the Boeotian [bee-OH-shun] League—at the Battle of Leuctra [LOOK-truh]. This location’s oral Constitution was called the Great Rhetra and was credited to Lycurgus [ly-KUR-gus]. Name this city-state that was led into the Battle of Thermopylae [ther-MAH-puh-lay] by Leonidas [lee-AH-nih-duss] and was known for its emphasis on military fitness.

Answer: **Sparta** or **Spartan**

6. Precious metals are separated from this metal using zinc in the Parkes process. Peukert’s [POY-kurt’s] law describes the efficiency of batteries that use this element and an acid. Traditionally, this element was a fundamental part of flint glass, though it is used less often now. Glass with this element in it is sometimes used to watch X-ray imaging, and patients often protect themselves wearing aprons that incorporate this element. Childhood exposure to this element is linked to violent behavior and lower IQs. Name this element whose use in old pipes inspired its Latin name, “plumbum”.

Answer: **lead**

7. In one novel by this author, Edmund helps his cousin write a letter to her brother William, promising that the letter will be franked by Edmund’s father Thomas Bertram. In another novel by this author, Harriet Smith refuses a marriage proposal from Robert Martin, and the title character refuses a proposal from Philip Elton before falling in love with George Knightley. In this author’s most famous novel, Charles Bingley and Fitzwilliam Darcy marry the sisters Jane and Elizabeth Bennet. Name this author of *Mansfield Park*, *Emma*, and *Pride and Prejudice*.

Answer: Jane **Austen**

8. W. E. B. Du Bois [doo boyss] said this person “is either a lunatic or a traitor”. This person was convicted of mail fraud for a flyer that made it look like his company had purchased the ship *Orion*, and he was deported from the United States after serving two years in prison. This person held an international rally in Liberty Hall in 1920 that was followed by 50,000 people marching through Harlem. This person started the Negro Factories Corporation, and he owned the Black Star Line. Name this founder of the Universal Negro Improvement Association who supported Pan-Africanism and was from Jamaica.

Answer: Marcus (Mosiah) **Garvey** (Jr.)

9. A priest in this novel writes an essay titled “Is a Priest Justified in Consulting a Doctor?”. Another character in this novel hides cans of meat under his bed to make money but dies before he can sell them. A magistrate in this novel says of his son “I hope Jacques did not suffer too much.” Joseph Grand has trouble perfecting his sentences and **Raymond Rambert** [ray-mawn rahm-bair] is a journalist from Paris in this novel, which opens with Ransdoc reporting on a rat infestation. Name this novel about Dr. Bernard **Rieux** [ree-yoo] working through a quarantine in **Oran** [aw-raw], written by Albert **Camus** [ka-moo].

Answer: *The **Plague*** or *La **Peste***

10. **Polynyas** [puh-LIN-yuz] are areas free of this substance at regular intervals, while **leads** [leeds] are only free of this substance at sporadic times and locations. Rime is a thin layer of this substance that forms on foggy nights. This substance can cause a type of weathering called **cryofracturing** [“CRY-oh-fracturing”]. Calving is the process of pieces of this substance breaking off into the ocean. Name this frozen substance that makes up sleet, hail, and glaciers.

Answer: **ice**

11. This island was the home of the extinct tiger-striped **thylacine** [“THIGH”-luh-seen]. A sequence of rounded columns called the Organ Pipes are on this island’s Mount Wellington, which overlooks the mouth of the River Derwent. This island’s northwest corner, Cape Grim, is the site of an 1828 clash between natives and the Van **Diemen** [DEE-mun] Land Company. A facial tumor disease is affecting a species of carnivorous rodents endemic to this island. The Bass Strait separates this island from Melbourne. Name this Australian state whose capital is Hobart and which is home to a namesake species of rodents called “devils”.

Answer: **Tasmania**

12. This sculptor’s depictions of Saints Petronius and **Proclus** [PROH-kluss] are at the Arca di San **Domenico** [doh-MEH-nee-koh] in **Bologna** [boh-LOHN-yah]. This sculptor showed the baby Jesus almost ready to take a step away from Mary, who is holding his hand, for a sculpture now located at Church of Our Lady in **Bruges** [broozh], Belgium. This person’s work for the tomb of Pope Julius II shows Moses with horns on his head. This artist’s work on display at the **Galleria dell’Accademia** [gahl-lair-EE-ah del-ah-kah-DAY-mee-ah] in Florence shows David holding his slingshot over his shoulder. Name this High Renaissance artist who painted the ceiling of the **Sistine** [SIS-teen] Chapel.

Answer: **Michelangelo** (di Lodovico) **Buonarroti** (Simoni) [accept either underlined name]

13. This character's daughter is abducted while trying to redeem him for trespassing on land sacred to the Furies. This man dies after failing to prevent a war between Polynices [pah-lee-NY-seez] and Eteocles [eh-TEE-oh-kleez]. This character gives the answer "man" to a question about walking on four legs, then two, and finally three. This protagonist spends his last days in Colonus [koh-LOH-nuss]. This character learns that he murdered his father, Laius ["LIE-us"], from the seer Tiresias ["tie"-REE-see-uss]. This king of Thebes blinds himself in a play by Sophocles [SAH-foh-kleez]. Name this king of Thebes [theebz] who marries Jocasta [yoh-KAH-stah], who is also his mother.

Answer: **Oedipus**

14. This battle occurred a few days after James Moore was killed aboard the *Margaretta* at Machias [muh-CHY-uss] and a few months before the Burning of Falmouth. A painting of this battle portrays the fatal injury of Colonel James Abercrombie and the deaths of Major John Pitcairn and General Joseph Warren. Thomas Gage was recalled to England after this battle even though the British were able to take Charlestown Peninsula on their third attempt. Name this battle during which, according to Parson Weems, either Israel Putnam or William Prescott stated "Don't fire until you see the whites of their eyes."

Answer: Battle of **Bunker Hill** [or Battle of **Breed's Hill**]

15. This composer's second symphony begins with a solemn C-minor movement and contains a fifth movement labeled "In the tempo of the scherzo ["SCARE"-tsoh]" that he called the "march of the dead". The second part of this composer's eighth symphony contains a "Mater Gloriosa" [MAH-tair glor-ee-OH-sah] section, and its two parts are *Veni, creator spiritus* [VAY-nee kray-AH-tor SPEER-ee-tooss] and the closing of Goethe's [GRR-tuh'z] *Faust*. This person conducted the premier of his eighth symphony in 1910, eight months before he died. Name this Austrian composer of the "Resurrection" Symphony and the "Symphony of a Thousand".

Answer: Gustav **Mahler**

16. When this industry was getting started, it was scandalized by the Spoils Conference, leading to charges against William MacCracken. For much of the 20th century this industry was dominated by the Big Four, one of which was called Eastern. A major deregulation of this industry in 1978 eventually led to many bankruptcies, including that of Pan Am. Following deregulation, many companies in this industry moved to a hub-and-spoke route system, one hub in which is called Douglas and is in Charlotte, North Carolina. Name this industry now led by American, Delta, United, and Southwest.

Answer: **airlines** or **air travel** [do not accept **airplanes** or **aerospace**]

17. Some of these devices use erbium-doped **yttrium** [IT-tree-um] aluminum garnet to create an output that is easily absorbed by water. That substance is used as a gain medium in an optical cavity in one of these objects that uses pumping to create population inversion. The output of this device is of a single frequency and phase, which makes it coherent. The most common type of this device uses helium and neon to produce a red output. Name this kind of device that uses stimulated emission to create a beam of light.

Answer: **laser**

18. This media organization collaborates with WBUR in Boston to produce “Here and Now”. This organization reads the Declaration of Independence on its *Morning Edition* each year in July, but was mistaken by some as calling for revolution against Donald Trump when it tweeted the document in 2017. Robert Siegel will depart the show he co-hosts on this network with Ari Shapiro and Audie Cornish, “All Things Considered”, in April 2018. Name this U.S. public media organization.

Answer: **National Public Radio** or **NPR**

19. The colony that became this country was the intended target of the British policy of “no independence before majority rule”, but it passed a Unilateral Declaration of Independence in 1965. After its long Bush War, this country negotiated the Lancaster House Agreement under the leadership of Ian Smith. From 2009 to 2013, this country had a shared power arrangement involving Morgan **Tsvangirai** [CHAN-gih-ry]. In the late 20th century, this country had a controversial land reform that took farms from white people, and it also endured hyperinflation. Name this African country that has long been led by Robert **Mugabe** [moo-GAH-bee].

Answer: (Republic of) **Zimbabwe** [accept Southern **Rhodesia**]

20. Cells pass through a column containing this **polysaccharide** [pah-lee-“SACK-uh-ride”] after going through **intains** [IN-tee-inz] in a form of affinity chromatography. This substance and a substance made by combining it with sodium hydroxide are made from **glucosamine** [“glue”-KOH-suh-meem], and recent studies claim they can help repair injuries. This second-most abundant polysaccharide after cellulose often exists with **resilin** [reh-ZIL-in]. **Cephalopods** [SEF-uh-loh-“pods”] such as squids have beaks made of this substance. Name this polymer found in **arthropod** [ARTH-roh-“pod”] exo*skeletons and fungus cell walls.

Answer: **chitin** [KY-tin]

21. Conformal and anti-conformal mappings preserve measures of these mathematical constructs; inversion is an example of an anti-conformal mapping. If one of these things in a polygon is of the reflex type, the polygon is concave. One of the geometric problems of antiquity was trisecting this kind of thing. Adding up the measures of the exterior types of these things in a polygon always gives the same sum. One unit for these things is defined as subtending a length of 1 on the unit circle, and is called the radian. Name these figures created by two rays with a common endpoint, some of which can be classified as acute or obtuse.

Answer: **angles**

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Bonuses

1. The **trachea** [TRAY-kee-uh] connects the **pharynx** [“FAIR-inks”] and **larynx** [LAIR-eenks] to this organ.

A. Name this organ that transfers oxygen to blood and takes out carbon dioxide from blood.

Answer: **lung(s)**

B. As it does for many organs, this term describes sections of the lungs. The right lung has three of these sections, but the left lung only has two.

Answer: **lobes**

C. This is the inward curve at the front bottom of the surface of the left lung.

Answer: **cardiac notch**

2. This text is a collection of stories told by pilgrims to the shrine of Thomas Becket.

A. Name this collection of stories written by Geoffrey Chaucer.

Answer: *The **Canterbury Tales***

B. In *The Canterbury Tales*, this woman tells a story about a knight who is given one year to answer the question, “What is the thing that women most desire?”

Answer: the **Wife of Bath** or **Alyson** [prompt on **Wife**]

C. In the tale, this character saves the knight’s life by having him answer the question.

Answer: the **queen** [accept **Guinevere**]

3. The **Bayeux** [“by-you”] Tapestry depicts the death of Harold Godwinson during this battle.

A. Name this 1066 battle, a major part of the Norman conquest of England.

Answer: Battle of **Hastings**

B. Shortly after the Battle of Hastings, this person was crowned as king of England.

Answer: **William I** or **William the Conqueror** or **William the Bastard** [prompt on **William**]

C. Just before the Battle of Hastings, this King of Norway invaded England but was killed at the Battle of Stamford Bridge.

Answer: Harald **Hardrada** (**Sigurdsson**) [accept either underlined name or **Harald III**; prompt on **Harald**]

4. In this novel, mastodons are found on the coast of the **Lidenbrock** [“LIE”-den-brahk] Sea.
A. Name this early science fiction novel in which Axel and his professor uncle voyage into an Icelandic volcano and find life along the subterranean **Hansbach** [HAHNZ-bahk] River.

Answer: ***Journey to the Center of the Earth*** [or ***Voyage au centre de la Terre***]

B. This French author wrote *Journey to the Center of the Earth*, as well as other adventure works like *Around the World in Eighty Days* and *Twenty Thousand Leagues Under the Sea*.

Answer: **Jules (Gabriel) Verne** [zhool vairn]

C. In *Twenty Thousand Leagues Under the Sea*, Pierre Arronax and Ned Land end up aboard this submarine built by Captain Nemo.

Answer: ***Nautilus***

5. Glucose, **ribose** [RY-bohss], and **acetic** [uh-SEE-tik] acid are all the same if you just look at this formula.

A. Name this formula that describes only the *ratios* of atoms in a molecule, not the actual numbers. For each of the compounds just mentioned, this formula is **CH₂O** [“C H two O”].

Answer: **empirical** formula

B. CH₂O is also the molecular formula for this compound whose systematic name is **methanal** [METH-uh-nal]. It is used in embalming.

Answer: **formaldehyde** [or **formalin**]

C. In some cases the molecular formula can be determined using the **Mark-Houwink** [HOW-wink] equation by knowing the empirical formula and the inherent value of this quantity for a solution. This quantity equals the resistance to gradual deformation by shear stress.

Answer: **viscosity**

6. This property states that changing the order of the operands does not change the result.

A. Name this property that, in the context of addition, means that x plus y always equals y plus x , no matter what x and y are.

Answer: **commutative** property (of addition) or **commutativity** (of addition)

B. If a group—which is a type of algebraic structure—is commutative, then it is known by this adjective derived from the name of a Norwegian mathematician.

Answer: **abelian** [uh-BEE-lee-un] group [prompt on Niels Henrik **Abel** [AH-bul]]

C. A property similar to the commutative property, but for relations, is known by this term. For equality, this property states that if x equals y , then y equals x .

Answer: **symmetric** property (of equality) or **symmetry** (of equality)

7. One of the postulates of special relativity states that this value is the same for all observers.

A. Identify this constant equal to about 3 times 10 to the 8th meters per second.

Answer: **speed of light** in a vacuum or **c**-naught

B. This scientist died in 1931 while working with Francis Pease and Fred Pearson to improve measurements of the speed of light. He earlier failed to observe the ether with Edward Morley.

Answer: Albert **Michelson**

C. This paradox led to the discovery that information can travel faster than the speed of light via quantum entanglement.

Answer: **Einstein-Podolsky-Rosen** paradox or **EPR** paradox

8. **Daedalus** [DEE-duh-luss] and **Icarus** [IK-uh-russ] designed the labyrinth where this creature lived, and Athens was forced to send people for it to eat.

A. Name this creature that was half man and half bull.

Answer: **Minotaur**

B. This daughter of **Minos** [MY-nohss] gave **Theseus** [THEE-see-uss] a ball of thread to help him navigate the maze when he killed the Minotaur.

Answer: **Ariadne** [“air”-ee-AD-nee]

C. Though Ariadne was in love with Theseus, he ended up marrying this sister of Ariadne as his second wife. This woman fell in love with Theseus’s son **Hippolytus** [hip-PAH-lih-tuss], who rejected her.

Answer: **Phaedra** [FEE-druh]

9. This German scientist stated two laws about circuits that are equivalent to the conservation of charge and the conservation of energy.

A. Name this scientist. His junction law states that the current going into any point in a circuit must equal the current coming out of that point.

Answer: Gustav **Kirchhoff**

B. Kirchhoff’s loop law is helpful when analyzing circuits with these components whose strength is measured in henries.

Answer: **inductors** [prompt on **solenoids**]

C. Using Faraday’s law of induction, the potential difference across an inductor equals the opposite of the derivative of this quantity with respect to time.

Answer: magnetic **flux** [prompt on **phi**; do not accept “(magnetic) flux density”]

10. The Hector **Berlioz** [bair-lee-ohz] composition of this type is called *Grande Messe des morts* [grahnd mess deh mort].

A. Give this term for a mass for the dead.

Answer: **requiem**(s)

B. Berlioz also wrote this program symphony whose last two parts are “March to the Scaffold” and “Dream of the Night of the Sabbath”.

Answer: ***Symphonie fantastique***

C. This is Berlioz’s second symphony. It is subtitled *Symphony in Four Parts with Viola Obbligato*, and it is based on a work by Lord Byron.

Answer: ***Harold in Italy*** or ***Harold en Italie***

11. Given these systems of equations, solve for x . You don’t need to find the values of any of the other variables.

A. $3x$ plus $2y$ equals 10, and $5x$ minus $2y$ equals 14

Answer: $x = \underline{3}$ [and $y = 1/2$]

B. y equals $3x$ plus 5, and y equals $4x$ plus 9

Answer: $x = \underline{-4}$ [and $y = -7$]

C. y equals x squared plus $2x$ plus 5, and y equals x squared plus $6x$ plus 3

Answer: $x = \underline{1/2}$ or $\underline{0.5}$ [and $y = 25/4$ or 6.25]

12. Soon after the movie producer Harvey Weinstein was accused of sexual misconduct in 2017, similar allegations were made against other powerful men.

A. This former-judge-turned-politician from Alabama has been accused of pursuing several underage girls, including calling one of them at school.

Answer: Roy (Stewart) **Moore**

B. This author of *Game Change* was accused of acting improperly when he was the political director of ABC News.

Answer: Mark (Evan) **Halperin** [HALP-prin]

C. Allegations of inappropriate comments led Michael Fallon to resign as this country’s Secretary of State for Defense. This country’s prime minister, Theresa May, replaced him with Gavin Williamson.

Answer: **United Kingdom** of Great **Britain** and Northern Ireland or **U.K.** [accept any underlined portion; do not accept “England”]

13. Several electoral votes in the election of 1876 were under dispute, so an Electoral Commission was created.

A. This Democratic governor of New York lost the election when the commission gave all of the disputed votes to Rutherford Hayes.

Answer: Samuel (Jones) **Tilden**

B. The Compromise of 1877 ended this era following the Civil War, in which there were competing visions for government treatment of former slaves.

Answer: **Reconstruction** Era

C. Hayes pushed for civil service reform during his presidency. After Hayes was president, Chester Arthur signed a civil service reform act named for this Ohio Senator who had been a rival of Hayes.

Answer: George **Pendleton** [accept **Pendleton** Civil Service Reform Act]

14. The protagonist of this work saves a book of paintings by Paul **Gauguin** [goh-gan] for a boy who visits every day.

A. Identify this novella in which Neil Klugman works at the Newark Public Library and carries on a summertime affair with the Radcliffe student Brenda Patimkin.

Answer: **“Goodbye, Columbus”**

B. This American author wrote “Goodbye, Columbus” as well as *Portnoy’s Complaint*.

Answer: Philip (Milton) **Roth**

C. In 2001, Philip Roth became the first winner of a literary prize named for this Czech author. This author wrote a novella about Gregor Samsa turning into a bug, “The Metamorphosis”.

Answer: Franz **Kafka**

15. This building was the tallest in the world until the completion of the World Trade Center.

A. Name this skyscraper designed by William Lamb with a large spire designed to hold **dirigibles** [deer-IJ-ih-bulz].

Answer: **Empire State** Building

B. Like New York City’s American Radiator Building and Chrysler Building, the Empire State Building’s architecture reflects this art movement that started in Paris.

Answer: art **deco** [or **style moderne**]

C. This Russian-born French designer—and leader of the art deco movement—worked in fashion, set design, and graphics. This person depicted a woman with her dog in *Symphony in Black*.

Answer: **Erté** or Romain de **Tirtoff**

16. This African country was formed in 1964 by the merger of a mainland country and an island nation.

A. Name this country that has transferred its capital from Dar-es-Salaam to Dodoma.

Answer: (United Republic of) **Tanzania** [tan-zuh-NEE-uh]

B. This person was the president of Tanganyika and then Tanzania until he stepped down in 1985. He issued an explanation of socialist policies called the Arusha Declaration.

Answer: Julius (Kambarage) **Nyerere** [nyeh-REH-reh]

C. In 1978, Tanzania invaded Uganda and eventually forced this Ugandan leader to leave his country.

Answer: Idi **Amin** (Dada)

17. A 2000 novella by this man “Remembered” his most famous character.

A. Identify this author of four novels about Harry Angstrom, from *Rabbit, Run* to *Rabbit at Rest*.

Answer: John (Hoyer) **Updike**

B. *Rabbit, Run* opens with Rabbit playing this game, which he had played in high school. Rick Telander described the culture of this sport in Brooklyn in *Heaven is a Playground*.

Answer: **basketball**

C. This other author wrote of a former high school basketball player returning to his reservation in Spokane in the short story “The Lone Ranger and Tonto Fistfight in Heaven”.

Answer: Sherman (Joseph) **Alexie** (Jr.)

18. The Pythagorean theorem can be considered a special case of this theorem when the angle is a right angle.

A. Name this “law” used to find unknown measurements of a triangle. It involves the three side lengths and a trig function applied to one of the angles.

Answer: law of **cosines**

B. What is the cosine of 60° ?

Answer: $\frac{1}{2}$ or **0.5**

C. Suppose a triangle has two sides measuring 1 unit and 3 units, and the angle between them measures 60° . What is the length of the third side?

Answer: the square **root** of 7 [accept **radical 7**]

19. This play opens with Orsino, the Duke of **Illyria** [il-EER-ee-uh], saying “If music be the food of love, play on.”

A. Identify this William Shakespeare play named for the end of Christmas.

Answer: ***Twelfth Night***(, or *What You Will*)

B. In *Twelfth Night*, this twin sister of Sebastian disguises herself as a man named **Cesario** [cheh-ZAR-ee-oh].

Answer: **Viola** [“VIE”-oh-luh]

C. During the play, Maria tricks **Malvolio** [mal-VOH-lee-oh] into wearing this type of clothing with crossed garters.

Answer: **yellow stockings** or **yellow socks** [ask “what color?” if not specified]

20. The sodium-glucose transport protein is used in this process.

A. Give the general two-word term for this process in which molecules or ions are moved from a region of lower concentration to a region of higher concentration.

Answer: **active transport**(ing) [prompt on partial answers]

B. A common example of active transport moves three sodium ions outside a cell while two ions of this element are moved into the cell.

Answer: **potassium** [accept **K** or **K⁺** or **K⁺¹** or **K¹⁺**]

C. The active transport of sodium and glucose is classified as this kind of active transport because everything moves in the same direction.

Answer: **symport**

21. The most prominent section of this diagram is a downward-sloping diagonal region called the main sequence.

A. Name this scatter plot of stars’ temperature and magnitude.

Answer: **Hertzsprung-Russell** diagram [accept **H-R** diagram]

B. The hottest stars, on the left of a typical H-R diagram, are designated by this letter.

Answer: **O**

C. **Ejnar** [“EYE”-nar] Hertzsprung confirmed Henrietta Swan Leavitt’s work on the relationship between the absolute magnitude and period of these stars, improving measurements of distances between galaxies.

Answer: **Cepheid** [SEFF-ee-id] variables or **Cepheid** variable stars [prompt on **variables** or **variable** stars]