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Subjects

1. Reading and Writing—Module 1
2. Reading and Writing—Module 2
3. Mathematics—Module 1
4. Mathematics—Module 2

Topic: 1

Reading and Writing—Module 1

Question: 1

Which choice completes the text so that it conforms to the conventions of Standard English?
The field of astronomy has made significant strides in recent years. thanks to advancements in technology and the development of powerful telescopes. These innovations have enabled astronomers to observe distant galaxies, study the formation of stars, and even detect exoplanets orbiting other stars. These discoveries

- A. that expand our knowledge of the universe
- B. and expand our knowledge of the universe
- C. have expanded our knowledge of the universe
- D. expanding our knowledge of the universe

Answer: C

Explanation:

In this passage, the sentence is in the present perfect tense, indicating that these innovations and discoveries have already occurred and continue to be relevant. The phrase "have expanded" in choice C correctly indicates a past action with ongoing implications. These innovations and discoveries. Initiated in the past, have contributed to expanding our knowledge of the universe, and this expansion is ongoing.

Question: 2

Which choice completes the text with the most logical and precise word or phrase?
The concept of community-based participatory research has gained prominence as a means of fostering collaborative efforts between indigenous communities and academic institutions. An illuminating example of such a partnership can be found in the collaboration between the Navajo Nation and the University of Arizona, which serves as a beacon of success in this field. Navajo citizens actively participated in the formulation of research methodologies, and they continue to play an integral role in data collection. This model of cooperation effectively the principles of community-based participatory research.

- A. circumvents
- B. eclipses
- C. fabricates
- D. exemplifies

Answer: D

Explanation:

Exemplifies is the correct choice because it means to serve as a typical or model example of something, which aligns perfectly with the passage's description of the collaboration between the Navajo Nation and the University of Arizona as a shining model demonstrating the principles of community-based participatory research. In contrast, Choice A (circumvents) implies avoidance or bypassing, directly contradicting the portrayal of the successful partnership in the passage. Choice B (eclipses) suggests complete overshadowing, which does not capture the collaborative essence intended by exemplifies. Choice C (fabricates) denotes a false creation, a concept that contradicts the genuine nature of the collaboration portrayed in the passage.

Question: 3

Which quotation from the passage most effectively illustrates the claim?

A student claims that the humanities are fundamental to human understanding, encompassing history, literature, philosophy, and the arts.

He offers the following as support for his claim:

The humanities, encompassing the study of history, literature, philosophy, and the arts, play a vital role in shaping our understanding of the human experience. It is through the lens of the humanities that we delve into human history, exploring the triumphs and tribulations of civilizations long past. Literature, with its profound narratives, allows us to walk in the shoes of characters from different times and cultures, expanding our empathy and perspective. Philosophy challenges us to ponder life's most profound questions, encouraging critical thinking and ethical reflection. The arts, whether in the form of paintings, sculptures, music, or dance, provide avenues for self-expression and the exploration of beauty and meaning. The humanities are not merely academic disciplines; they are the very essence of what it means to be human, offering insights into our past, shaping our present, and guiding our future.

- A. "The humanities are not merely academic disciplines; they are the very essence of what it means to be human."
- B. "Literature, with its profound narratives, allows us to walk in the shoes of characters from different times and cultures."
- C. "It is through the lens of the humanities that we delve into human history."
- D. "Philosophy challenges us to ponder life's most profound questions, encouraging critical thinking and ethical reflection."

Answer: A

Explanation:

This quotation effectively illustrates the claim made in the passage about the role and significance of the humanities. It conveys the central idea that the humanities are not just academic subjects but are

deeply connected to the essence of humanity itself. It emphasizes that the humanities are integral to our understanding of the human experience and our identity as human beings.

Question: 4

What does the order of the steps in the scientific method in this passage primarily serve to do?

The scientific method is a systematic approach to solving problems and answering questions. The first step is making careful observations of the natural world. By observing phenomena and gathering data, scientists can identify patterns or anomalies that pique their curiosity. These observations lead to the formation of hypotheses, which are educated guesses about the underlying explanations for what is observed. Subsequently, scientists design experiments to test these hypotheses and collect further data. Finally, they analyze the data to draw conclusions and advance our understanding of the natural world. The initial step of making observations is crucial, as it provides the foundation for scientific inquiry.

- A. To provide a chronological account of scientific discoveries
- B. To persuade readers to engage in scientific research
- C. To emphasize the importance of making observations
- D. To explain the process of conducting experiments

Answer: C

Explanation:

In this passage, the order of the steps in the scientific method serves primarily to emphasize the importance of making observations. The passage outlines the steps of the scientific method sequentially and highlights that it starts with making observations. This structure emphasizes the foundational role of observation in the scientific process. While the scientific method does involve forming hypotheses. Conducting experiments, and analyzing data, the passage's primary focus is on the initial step of making observations and how it contributes to scientific progress.

Question: 5

Which choice best characterizes the purpose of Sarah's statement, "Believe me, Alex, your excuses won't cut it this time"?

In a bustling cafe on a rainy afternoon, Sarah and Alex found themselves in a tense conversation. Sarah's eyes narrowed as she leaned in, her voice dripping with disdain.

"Believe me, Alex, your excuses won't cut it this time."

Alex, taken aback, responded firmly, "I stand by my decisions, Sarah."

It was a showdown neither of them had expected.

- A. It reflects Sarah's admiration for Alex's decisions.
- B. It signifies Sarah's understanding of Alex's predicament.
- C. It conveys Sarah's skepticism and criticism of Alex's explanations.
- D. It demonstrates Sarah's eagerness to collaborate with Alex.

Answer: C

Explanation:

In the provided passage, Sarah's statement, "Believe me, Alex. your excuses won't cut it this time." is marked by her narrowed eyes and disdainful tone. This expression suggests a strong sense of skepticism and criticism. She is clearly not supportive of Alex's explanations and is questioning their validity.

Therefore, Choice C, which characterizes Sarah's statement as conveying skepticism and criticism, best aligns with the purpose of her statement in the context of the passage.

Question: 6

Which finding, if true, would most directly support the notion that the leafcutter ants have evolved specialized adaptations for efficient farming of their fungus gardens?

In the heart of the Amazon rainforest, the remarkable leafcutter ant colonies thrive and display complex social structures with a sophisticated division of labor. The ants are particularly renowned for their ability to harvest leaves and carry them back to their underground nests where they use the leaves to cultivate a fungus garden. The fungus serves as their primary food source, and the leafcutter ants have evolved specialized adaptations to make this farming process efficient and productive.

- A. Leafcutter ants have been observed using leaves from a wide variety of plant species for their fungus gardens.
- B. The fungus cultivated by leafcutter ants has been found to be a unique, previously undiscovered species.
- C. Leafcutter ant colonies located deeper in the rainforest are less efficient at harvesting leaves than those near the forest edge.
- D. Leafcutter ants possess a specialized enzyme that enhances the growth of the fungus they cultivate.

Answer: D

Explanation:

The passage discusses how leafcutter ants have evolved specialized adaptations for efficiently farming their fungus gardens. In this context, the presence of a specialized enzyme that enhances the growth of the cultivated fungus directly supports the idea that they have evolved specific mechanisms to optimize their farming process.

Question: 7

The student wants to emphasize the uniqueness of periods. Which choice most effectively uses relevant information from the notes to this goal?

While researching a topic, a student has taken the following notes:

Ancient Greek philosophers emphasized the pursuit of knowledge and wisdom.

- Renaissance art celebrated humanism and individualism.
- The Enlightenment promoted reason, science, and skepticism.
- Romantic literature valued emotions, nature, and imagination.
- Postmodernism challenged traditional narratives and embraced diversity.

- A. Ancient Greeks and The Enlightenment valued knowledge and wisdom.
- B. The Enlightenment's focus on reason, science, and skepticism was common among many historical

- C. Romantic literature valued imagination and nature, setting it apart from other historical periods.
D. Like many other eras, the Renaissance shared a celebration of humanism and individualism.

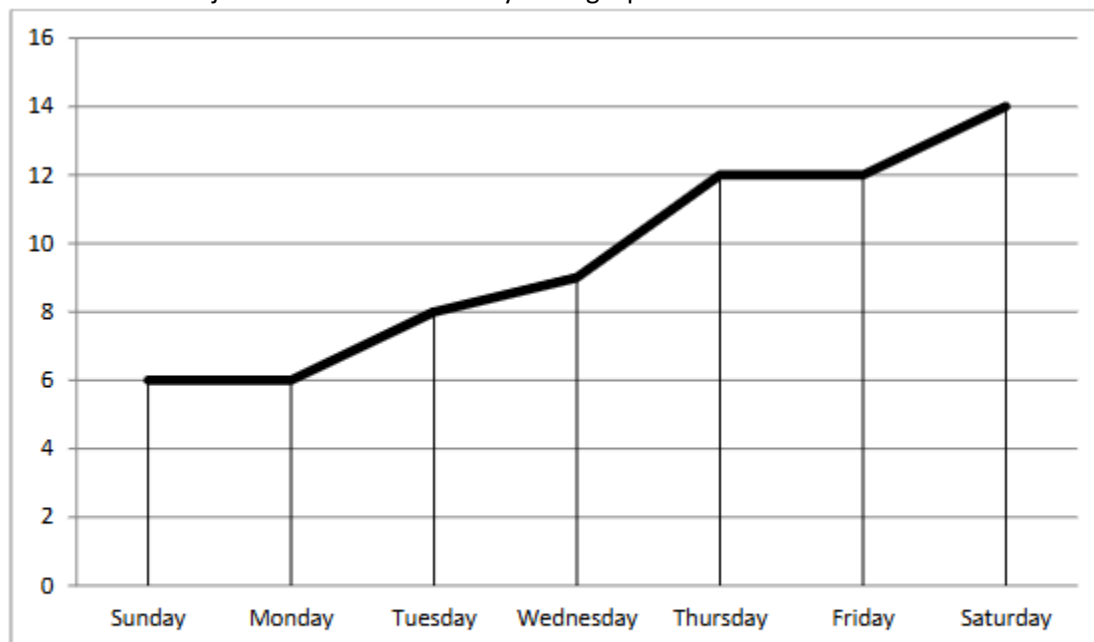
Answer: C

Explanation:

Choice C effectively highlights the uniqueness of Romantic literature by emphasizing its distinctive focus on imagination and nature. This choice directly addresses the student's goal of emphasizing each period's uniqueness.

Question: 8

Every time Miguel gets quarters in change, he puts them in a jar. The chart above shows how many quarters he has in the jar at the end of each day during a particular week.



Which day did Miguel add the most quarters to the jar?

- A. Monday
B. Tuesday
C. Thursday
D. Saturday

Answer: C

Explanation:

The line climbs the most sharply between Wednesday and Thursday, growing by 3 (from 9 to 12). Since the measurement is taken at the end of each day, we know there were 9 quarters in the jar at the end of Wednesday and 12 at the end of Thursday, so 3 quarters were added on Thursday.

Question: 9

The half-life of caffeine in the human body is 5 hours. If Rafe drinks a cup of coffee at 7:00 a.m., what percentage of the caffeine is still in his system at 2:00 p.m.? Round your answer to the nearest whole percent.

A. Answer in Explanation

Answer: A

Explanation:

We start with the formula $y(t) = ae^{kt}$ where a is the starting amount and t is the time in hours. Since the half-life is 5, we can write $0.5 = 1e^{k(5)}$. We then solve by taking the natural logarithm of each side.

$$\begin{aligned}\ln(0.5) &= \ln(e^{5k}) \\ \ln(0.5) &= 5k \\ k &= \frac{\ln(0.5)}{5}\end{aligned}$$

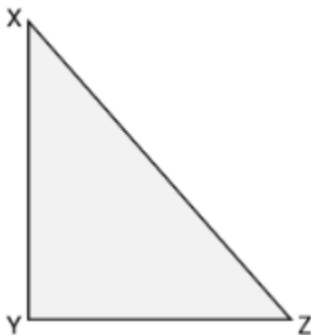
At 2:00 p.m., it has been 7 hours since Rafe drank the cup of coffee, so we can put that into the equation.

$$y(7) = 1e^{(k)(7)} \approx 0.379$$

This translates to 37.9%, or approximately 38%.

Question: 10

In right triangle $\triangle XYZ$ below, angle Z measures z° and $\sin z^\circ = \frac{4}{5}$. What is $\cos(90 - z)^\circ$?



A. Answer in Explanation

Answer: A

Explanation:

The sine of an angle can be calculated as the opposite side (4) divided by the hypotenuse (5). If angle Z measures z° , then angle X measures $(90 - z)^\circ$, so we are looking for the cosine of angle X . We can find the cosine of angle X by taking the adjacent side (4) and dividing by the hypotenuse (5). So, the answer is $\frac{4}{5}$, or 0.8.

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