

ETS GRE Power plus (Online Practice Test 2) [Save \$39]

Issue Writing

Some people believe that government officials must carry out the will of the people they serve. Others believe that officials should base their decisions on their own judgement.

Write a response in which you discuss which view more closely aligns with your own position and explain your reasoning for the position you take. In developing and supporting your position, you should address both of the views presented.

Argument Writing

The following recommendation was made by the president and administrative staff of Grove College, a private institution, to the college's governing committee.

"We recommend that Grove College preserve its century-old tradition of all-female education rather than admit men into its programs. It is true that a majority of faculty members voted in favor of coeducation, arguing that it would encourage more students to apply to Grove. But 80 percent of the students responding to a survey conducted by the student government wanted the school to remain all female, and over half of the alumnae who answered a separate survey also opposed coeducation. Keeping the college all female will improve morale among students and convince alumnae to keep supporting the college financially."

Write a response in which you discuss what questions would need to be answered in order to decide whether the recommendation and the argument on which it is based are reasonable. Be sure to explain how the answers to these questions would help to evaluate the recommendation.

Section 1 : Verbal

Q's-01

Because economists have yet to identify a pattern of economic indicators that consistently _____ a rise or fall in employment, they have not been able to furnish governments with a method for predicting unemployment rates.

| |
|-------------|
| withstand |
| result from |
| amplify |
| precede |
| factor out |

Explanation

Question Explanation

The “because” structure of the sentence indicates that the first part of the sentence gives a reason for a conclusion reached in the second part of the sentence. The conclusion is that economists have been unable to provide governments with a “method for predicting unemployment rates.” Of the choices given, “precede” works best in the blank in spelling out a reason for this conclusion: information (currently lacking) about what indicators usually precede a rise or fall in employment would certainly be helpful for predicting unemployment rates.

Thus the correct answer is **precede**.

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-02

The geologist suggested that as the most productive oil reservoirs begin to dry up, the high costs and potential risks of drilling in more marginal locations will come to seem less _____ and more acceptable.

| |
|-------------|
| efficacious |
| onerous |
| paltry |
| redundant |
| auspicious |

Explanation

Question Explanation

The words “less” and “more” as they are used in the sentence signal that the word that fills the blank will contrast with “acceptable.” Both “efficacious” and “auspicious” fail to contrast with “acceptable,” thus eliminating those two choices. Of the remaining choices, we need to pick the word that describes how “the high costs and potential risks” appear under optimal conditions. At the same time, the word (in conjunction with “less”) must describe how “the high costs and potential risks” will come to seem as the most productive oil reservoirs begin to dry up. Only “onerous” satisfies both criteria.

Thus the correct answer is **onerous**.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-03

The question of whether or not a novel species is accepted by local ecological scientists as a natural component of a given ecosystem is not (i)_____: if a species believed to be exotic is also categorized as potentially harmful, then expensive, laborious, and even ecologically destructive eradication initiatives may (ii)_____.

Blank (i)

| |
|------------|
| trivial |
| answerable |
| difficult |

Blank (ii)

| |
|--------------|
| ensue |
| be delayed |
| be evaluated |

Explanation

Question Explanation

Looking to the first part of the sentence, we see that it is hard to select the correct answer for Blank (i) since all three choices can fit in the immediate context. Looking to the second part of the sentence, we see that this part is relatively self-contained. The word that fills Blank (ii) must help to describe what will happen if an exotic species is characterized as potentially harmful. Of the choices given, “ensue” clearly works best in the blank to fit the logic. Now given that “eradication initiatives may ensue” if a novel species is considered potentially harmful, we can conclude that the question asked in the first part of the sentence is not “trivial.”

Thus the correct answer is **trivial** and **ensue**.

Difficulty level: 3 (1 = easy, 5 = hard)

Q's–04

Modern attempts to find a dark, brooding layer in Mozart’s psychology have been (i)_____. True, in his correspondence he once or twice displays depressive symptoms—alluding to his “black thoughts” and describing sensations of coldness and emptiness—but the context is (ii)_____ : in the first instance he is begging for money, and in the second he is telling his wife how much he misses her.

| Blank (i) | Blank (ii) |
|---------------------|-----------------|
| uncommon | all-important |
| unconvincing | barely relevant |
| ubiquitous | giddily exotic |

Explanation

Question Explanation

The correct answer for Blank (i) can’t be determined without considering the second sentence. Looking to the second sentence, the word “but” hints at the idea that the two displays of depressive symptoms in Mozart’s letters do not help to establish a “dark, brooding layer in Mozart’s psychology.” Given this, we can return to the first sentence and select “unconvincing” as the correct answer for Blank (i).

To select the correct answer for Blank (ii), we can look to what comes after the colon, which specifies the context of the two displays of depressive symptoms in Mozart’s letters. The context suggests that the two displays weren’t actually displays of chronic depression. So the context, we can conclude, is quite important in establishing that there’s no “dark, brooding layer in Mozart’s psychology.” Given this, we can select “all-important” as the correct answer for Blank (ii).

Thus the correct answer is **unconvincing** and **all-important**.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's–05

In his study of the physical feeling of disgust, Kelly makes claims that are both (i)_____ and (ii)_____ ; he advances arguments about how disgust evolved over time and what triggers it.

| Blank (i) | Blank (ii) |
|------------|---------------|
| inchoate | inductive |
| esoteric | causal |
| historical | arbitrary |

Explanation

Question Explanation

The colon indicates that the second part of the sentence will explain or spell out the first part. From the second part of the sentence we know that Kelly's arguments in the study are about (1) how disgust evolved over time and (2) what triggers disgust. We can conclude, therefore, that his claims in that study are "historical," given his arguments about (1), and "causal," given his arguments about (2).

Thus the correct answer is **historical** and **causal**.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's–06

People love to talk about their commutes to and from work: those with an easy commute tend to (i) _____, while those who hate their commute think and speak of it as a core affliction, like a chronic illness. Once you raise the subject, the testimonies pour out, and, if your ears are tuned to it, you begin overhearing commute talk everywhere. People who are normally (ii) _____ may, when describing their commutes, be unexpectedly (iii) _____ divulging the intimate details of their lives.

Blank (i)

| |
|-------------|
| grumble |
| commiserate |
| gloat |

Blank (ii)

| |
|-------------|
| inattentive |
| garrulous |
| circumspect |

Blank (iii)

| |
|-----------------|
| candid in |
| economical in |
| flustered about |

Explanation

Question Explanation

Looking to the first sentence, the word "while" suggests a contrast between how two groups of people, namely those with an easy commute and those who hate their commute, talk about their commuting experiences. Given the suggested contrast, if the latter group talks about their commute as "a core affliction, like a common illness," the former group must speak positively about their commute. Of the answer choices for Blank (i), only "gloat" fits the given context.

Next, looking to the last sentence, it's easier to fill in Blank (iii) before filling in Blank (ii) since we already know from the first two sentences how people are "when describing their commutes": they are talkative. Of the answer choices for Blank (iii), only "candid in" suggests talkativeness.

Having selected "candid in" for Blank (iii), we can choose the correct answer for Blank (ii). The words "normally" and "unexpectedly" signal that the words following them will contrast with each other, so the word that fills Blank (ii) must contrast with "candid in." Of the answer choices for Blank (ii), only "circumspect" provides the necessary contrast.

Thus the correct answer is **gloat**, **circumspect**, and **candid in**.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-07

Questions 7 and 8 are based on this passage.

San Lorenzo, center of the ancient Mesoamerican Olmec culture, is famous for its massive stone statuary and distinctive ceramic figurines. Archaeologists disagree, however, about why Olmec-style ceramics have also been found at sites very distant from the Olmec heartland. Proponents of the mother-culture interpretation point to the statuary as indicative of unprecedented social organization and interpret the distribution of the ceramics as evidence of Olmec influence on less complex societies. According to the sister-cultures interpretation, however, these Olmec-style objects are simply a visual expression of religious beliefs shared by numerous Mesoamerican cultures whose contact with one another increased over time. The Olmec were neither solely responsible for the creation and spread of the style nor more advanced than the cultures they contacted.

It can be inferred that proponents of the sister-culture interpretation would be LEAST likely to agree with proponents of the mother-culture interpretation on which of the following issues?

- The importance of religion in Olmec society
- The degree of contact between San Lorenzo and other Mesoamerican cultures
- The place where Olmec-style objects discovered far from San Lorenzo were produced
- The relative contribution the center of the Olmec culture made to the Olmec style of ceramics
- The level of social organization needed to produce the Olmec stone statuary in San Lorenzo

Explanation

Passage Description

The passage presents and contrasts two theories about the observed distribution of certain Mesoamerican artifacts.

Question Explanation

According to the passage, the mother-culture interpretation holds that Olmec culture dominated surrounding, less sophisticated cultures, whereas the sister-culture interpretation holds that Mesoamerican cultures of the time were equally sophisticated and independently developed similar objects. This points to **Choice 4** as the correct answer choice. Nothing in the passage suggests disagreement about the importance of religion in Olmec society (Choice 1). The two interpretations disagree about the relative contributions of Mesoamerican cultures, but there is no indication of disagreement about the amount of contact among them (Choice 2). The two interpretations can also agree about the location of the creation of the ceramics, since it is the origin of the Olmec style that is at issue (Choice 3). The passage does not suggest there is any disagreement that a high level of social organization would have been required to produce San Lorenzo's statuary (Choice 5).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-08

Questions 7 and 8 are based on this passage.

San Lorenzo, center of the ancient Mesoamerican Olmec culture, is famous for its massive stone statuary and distinctive ceramic figurines. Archaeologists disagree, however, about why Olmec-style ceramics have also been found at sites very distant from the Olmec heartland. Proponents of the mother-culture interpretation point to the statuary as indicative of unprecedented social organization and interpret the distribution of the ceramics as evidence of Olmec influence on less complex societies. According to the sister-cultures interpretation, however, these Olmec-style objects are simply a visual expression of religious beliefs shared by numerous Mesoamerican cultures whose contact with one another increased over time. The Olmec were neither solely responsible for the creation and spread of the style nor more advanced than the cultures they contacted.

Consider each of the choices separately and select all that apply.

Which of the following discoveries would provide evidence favoring either one or the other of the two interpretations?

- The discovery that a high proportion of the Olmec-style pottery found in San Lorenzo was made in settlements outside the Olmec heartland.
- The discovery that while many settlements outside the Olmec heartland had ceramics that had been made in San Lorenzo, none had ceramics that had been made in other such settlements.
- The discovery that one particular style of Olmec-style ceramic was found in a number of settlements outside the Olmec heartland but not in San Lorenzo.

Explanation

Passage Description

The passage presents and contrasts two theories about the observed distribution of certain Mesoamerican artifacts.

Question Explanation

Choices 1, 2, and 3 are correct. The question asks about evidence that would support either of the two interpretations presented in the passage.

Choice 1 is correct: The manufacture of Olmec-style pottery in places other than San Lorenzo, and its apparent import back to San Lorenzo, would support the sister-culture view that contemporary Mesoamerican cultures were equally sophisticated in their creation of ceramics.

Choice 2 is correct: If most or all pottery artifacts appeared to have been manufactured in San Lorenzo, this would support the mother-culture view that Olmec-style objects were distributed by the Olmec culture rather than independently created elsewhere.

Choice 3 is correct: The discovery of Olmec-style ceramics outside the Olmec heartland but not represented in San Lorenzo itself would support the sister-culture view that various, equally sophisticated cultures were capable of creating Olmec-style ceramics on their own.

Difficulty level: 5 (1 = easy, 5 = hard)

Q's–09

As clucks of disapproval about Americans' political _____ have grown louder in recent years, many historians have looked for contrast to the decades before the Civil War as a time when Americans were enthusiastically engaged in politics.

- zealotry
- apathy
- hypocrisy
- partisanship
- insincerity
- passivity

Explanation

Question Explanation

The word “contrast” as it’s used in the sentence suggests that the word that fills the blank must describe something that’s contrary to the idea of Americans being “enthusiastically engaged in politics.” Of the answer choices, only “apathy” and “passivity” produce alike sentences that convey the idea of Americans not being enthusiastically engaged in politics. “Hypocrisy” and “insincerity” also create sentences that are alike in meaning, but they fail to provide the necessary contrast.

Thus the correct answer is **apathy** (Choice 2) and **passivity** (Choice 6).

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-10

As a proponent of women's traditional roles, Sarah Hale was adamantly against women's suffrage as thrusting women into an improper sphere; yet she _____ female textile strikers when they publicly protested their mistreatment at mills.

- opposed
- supported
- criticized
- championed
- challenged
- welcomed

Explanation

Question Explanation

The word “yet” as it’s used in the sentence indicates that there’s some tension between Sarah Hale being “adamantly against women’s suffrage” and her reaction toward the “female textile workers when they publicly protested their mistreatment at mills.” A positive reaction toward the female textile workers would supply this tension. Of the answer choices, only “supported” and “championed” describe positive reactions and create sentences that are alike in meaning. “Opposed” and “championed” also create sentences that are alike in meaning, but they fail to provide the necessary tension.

Thus the correct answer is **supported** (Choice 2) and **championed** (Choice 4).

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-11

Manga—illustrated Japanese books that are read from right to left—are beginning to win fans, _____ the enormous success of anime films such as Miyazaki’s breathtaking *Spirited Away*.

- bringing about
- buoyed by
- contrasted with
- helped by
- independent of
- leading to

Explanation

Question Explanation

The sentence suggests that there's some connection between (1) "the enormous success of anime films" and (2) the fact that "Manga are beginning to win fans." The phrase that fills the blank must help to explain this connection. Of the answer choices, "buoyed by" and "helped by" produce alike sentences that give us the most logical connection between (1) and (2): the existing success of one form of entertainment (anime films) helped to increase the popularity of a related form of entertainment (Manga). Though "bringing about" and "leading to" also create sentences that are alike in meaning, the sentences don't make sense logically.

Thus the correct answer is **buoyed by** (Choice 2) and **helped by** (Choice 4).

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-12

When food companies seek to inflate their revenues by reducing the amount of food in each package without offering a corresponding price reduction, their marketing campaigns are often _____, claiming that the smaller versions are healthier, with fewer calories than before.

- inept
- uninformed
- shrewd
- ignorant
- artful
- disorienting

Explanation

Question Explanation

The word that fills the blank must describe the marketing campaigns that food companies run when they want to make more money by reducing the amount of food in each package without reducing the price of the package. According to the sentence, these campaigns claim "smaller versions are healthier, with fewer calories than before" and, in so doing, put a positive spin on the companies' clearly non-altruistic motives for reducing the amount of food in each package. Of the answer choices, only "shrewd" and "artful" produce alike sentences that correctly describe such campaigns. "Uninformed" and "ignorant" also create sentences that are alike in meaning," but they fail to describe campaigns of the sort mentioned.

Thus the correct answer is **shrewd** (Choice 3) and **artful** (Choice 5).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-13

Question 17 is based on this passage.

Last year, Fillmore County's farmers used Sordane, a highly effective nonpersistent pesticide, on their crops. Though crop yields were satisfactory, aerial spraying of Sordane increased the county's incidence of respiratory illness. This year, farmers sprayed with the weaker pesticide Kaskanine instead. Crop yields were unchanged, while the county experienced a significant decline in respiratory illness. Therefore, if farmers use only Kaskanine next year, the reduced incidence of respiratory illness will be maintained without sacrificing crop yields.

Which of the following would it be most useful to establish in order to evaluate the argument?

- Whether Sordane is the most effective pesticide available to farmers in Fillmore County
- Whether, as a result of last year's spraying of Sordane, this year's population of harmful insects was smaller than it would have been in a year following one in which farmers used only Kaskanine
- Whether the increase in the incidence of respiratory illness in Fillmore County caused by aerial spraying of Sordane was the only consideration in the farmers' decision to switch to Kaskanine
- Whether the use of Sordane has been discontinued in other counties for the same reasons as in Fillmore County
- Whether restrictions on the use of Sordane could have produced a significant reduction in the incidence of respiratory illness

Explanation

Passage Description

The passage discusses the effect of Fillmore County's decision to switch from the pesticide Sordane to the weaker Kaskanine and notes that after one year, crop yields remained the same but the incidence of respiratory illness in the county declined.

Question Explanation

The passage argues that replacing Sordane with Kaskanine would maintain the benefits and reduce the drawbacks. Crop yields after using Kaskanine were as good as they had been with Sordane, suggesting that Kaskanine was equally effective at controlling harmful insects. However, it is unclear whether Kaskanine alone would be as effective if used in consecutive years, as the prior use of Sordane may have resulted in persistent reductions in insect populations. This points to **Choice 2** as correct. Choice 5 suggests a potential compromise that would allow for a modified use of Sordane that might also reduce respiratory illness, but the argument in the passage is for its use to be eliminated in favor of Kaskanine. None of the other choices (Choice 1, Choice 3, Choice 4) addresses the issue of Kaskanine's efficacy.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-14

Questions 18 to 20 are based on this passage.

Among some Native American peoples, the oral tradition of one group has sometimes influenced that of another; indeed, tracing such influence has been one major task of scholars of Native American oral literature. European influences are often regarded, understandably, as another matter. Nellie Barnes, for example, in an early stylistic study of Native American oral literature, considered only forms preceding the influence of Europeans. Yet the example of the Zuni version of the Italian folk tale "The Cock and the Mouse" suggests that, notwithstanding the opinions of scholars of Native American oral literature, European influence is not always synonymous with the waning of Native American traditions. The Zuni narrator utilized the European story as an opportunity to exercise his narrative genius, thus leaving his tradition enhanced rather than diminished by the European influence. Such examples should cause scholars researching influences on Native American oral narratives to reassess their notions of the proper domain of such studies.

The passage is primarily concerned with

- assessing the extent of a particular influence on a narrative tradition
- pointing out the prevalence of a type of narrative once thought to be rare
- reporting results of recent research on a particular narrative tradition
- proposing an expansion of the focus of a particular area of research
- illustrating the use of an unconventional new research methodology

Explanation

Passage Description

The passage points out that the conventional approach to studying Native American oral literature was to concentrate on the influences various native groups had on one another while disregarding European-influenced examples.

Question Explanation

The passage implies that a bias among scholars has resulted in a limited understanding of how Native Americans incorporated European influences into their oral traditions. This potential oversight points to **Choice 4** as correct. While the passage mentions some recent research, that is not its primary focus, eliminating Choice 3 and Choice 5. There is no assessment of the extent of any particular influence on a narrative tradition (Choice 1), nor of the general prevalence of one type of narrative (Choice 2).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-15

Questions 18 to 20 are based on this passage.

Among some Native American peoples, the oral tradition of one group has sometimes influenced that of another; indeed, tracing such influence has been one major task of scholars of Native American oral literature. European influences are often regarded, understandably, as another matter. Nellie Barnes, for example, in an early stylistic study of Native American oral literature, considered only forms preceding the influence of Europeans. Yet the example of the Zuni version of the Italian folk tale “The Cock and the Mouse” suggests that, notwithstanding the opinions of scholars of Native American oral literature, European influence is not always synonymous with the waning of Native American traditions. The Zuni narrator utilized the European story as an opportunity to exercise his narrative genius, thus leaving his tradition enhanced rather than diminished by the European influence. Such examples should cause scholars researching influences on Native American oral narratives to reassess their notions of the proper domain of such studies.

According to the passage, an important focus of research for scholars of Native American oral literature has been

- tracing the influence of European tales on Native American narrative traditions
- reconstructing the form in which Native American tales existed prior to being influenced by European narrative elements
- documenting how Native American oral traditions have influenced one another
- identifying features of Native American narratives that betray European influences
- analyzing the significance of differences that appear in particular Native American narratives after exposure to European influence

Explanation

Passage Description

The passage points out that the conventional approach to studying Native American oral literature was to concentrate on the influences various native groups had on one another while disregarding European-influenced examples.

Question Explanation

As described above, the passage argues that scholars of Native American oral literature have traditionally been too narrowly focused on the exchange of influences among Native American peoples. This points to **Choice 3** as correct. The passage does not discuss attempts to reconstruct an early form of Native American tales (thus eliminating Choice 2) and asserts that European influence on such tales has not been sufficiently studied (eliminating Choice 1, Choice 4, and Choice 5).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-16

Questions 18 to 20 are based on this passage.

Among some Native American peoples, the oral tradition of one group has sometimes influenced that of another; indeed, tracing such influence has been one major task of scholars of Native American oral literature. European influences are often regarded, understandably, as another matter. Nellie Barnes, for example, in an early stylistic study of Native American oral literature, considered only forms preceding the influence of Europeans. Yet the example of the Zuni version of the Italian folk tale “The Cock and the Mouse” suggests that, notwithstanding the opinions of scholars of Native American oral literature, European influence is not always synonymous with the waning of Native American traditions. The Zuni narrator utilized the European story as an opportunity to exercise his narrative genius, thus leaving his tradition enhanced rather than diminished by the European influence. Such examples should cause scholars researching influences on Native American oral narratives to reassess their notions of the proper domain of such studies.

The author of the passage refers to Nellie Barnes’ study most probably in order to do which of the following?

- Point out a weakness common to early stylistic studies of most oral literature
- Illustrate a research approach commonly taken by scholars of Native American oral literature
- Provide an example of an anomalous approach to the study of Native American oral traditions
- Contrast the assumptions guiding early research with those guiding study of Native American oral literature today
- Draw attention to an area of research that has been increasingly neglected by scholars in recent years

Explanation

Passage Description

The passage points out that the conventional approach to studying Native American oral literature was to concentrate on the influences various native groups had on one another while disregarding European-influenced examples.

Question Explanation

According to the passage, most research into Native American oral traditions has focused on the influence of native groups on each other and ignored potential European influences. This points to **Choice 2** as the correct choice: Barnes’ research is presented as an example of the traditional approach. Since Barnes’ study is presented as typical, it would not be properly characterized as “anomalous” (Choice 3). The passage does imply Barnes’ approach reflects a weakness in certain studies, but the passage is concerned only with Native American oral literature, not “most” oral literature (Choice 1). The passage encourages a shift of attention in current research, meaning that the assumptions guiding research today are not yet in contrast with those guiding earlier research, thus eliminating Choice 4. Finally, Choice 5 is in direct opposition to the focus of the passage, which contends that Barnes’ approach represents a traditional approach that persists rather than is neglected.

Difficulty level: 4 (1 = easy, 5 = hard)

Questions 9 to 12 are based on this passage.

Observations of social play in several species of mammals indicate that individuals often depart from the usual social conventions by, for example, alternating dominant and subordinate positions in ways that do not occur outside the play context. Some researchers have even suggested that individuals must follow a 50:50 rule during dyadic play (play between two individuals), so that each participant wins an equal proportion of play encounters. Commonly cited cooperative tactics used to equalize play include self-handicapping (participants make themselves more vulnerable to attacks by their opponents) and role reversal (individuals that are dominant in the nonplay context appear subordinate during play). Where such tactics occur among unevenly matched opponents, they appear to facilitate play by making play more appealing to the less advantaged player.

When Bauer and Smuts set out to study play behavior in domestic dogs, they made several predictions. They expected to find no significant sex differences in dogs' play behavior. The motor skills dogs use in play fighting parallel those used in nonplayful aggression and hunting, areas in which dogs' behavior is relatively undifferentiated by sex. They also predicted that the advantages imparted by larger relative size, by the experience of age, and by higher dominance status would affect dogs' dyadic play. Existing research on a variety of animal species suggests that individuals with such advantages often refrain from attacks and pursuits or engage in self-handicapping so as not to intimidate their play partners. If this held true for dogs, larger, older, more dominant dogs would show more self-handicapping than their partners. But Bauer and Smuts predicted instead that dogs would deviate from the hypothetical 50:50 rule, with advantaged individuals retaining their positions by performing the majority of attacks and pursuits and engaging in

self-handicapping so as not to intimidate their play partners. If this held true for dogs, larger, older, more dominant dogs would show more self-handicapping than their partners. But Bauer and Smuts predicted instead that dogs would deviate from the hypothetical 50:50 rule, with advantaged individuals retaining their positions by performing the majority of attacks and pursuits and engaging in fewer self-handicapping behaviors than their partners, thus reinforcing existing hierarchies.

Bauer and Smuts' three-year study of dogs' dyadic play found that most dyads showed some degree of asymmetry (one dog winning more encounters than the other) and some dyads showed complete asymmetry. They also found that in general, older dogs performed more attacks and pursuits and that younger dogs engaged in more self-handicapping. Role reversal between dominant and subordinate individuals varied widely: several dyads never reversed dominance roles, a few reversed them frequently, and most reversed them occasionally.

Bauer and Smuts' finding about asymmetry in dyadic play has several implications. First, it indicates that active self-handicapping and role reversals are not necessarily required for play to occur. Indeed, play often continued at length even when one partner always won. Second, since frequent role reversals occurred, it appears that normal status asymmetries are often significantly more relaxed in the play context. This suggests that role reversals, while not always necessary, probably do facilitate play.

Q's-17

The primary purpose of the passage is to

- contrast two different but closely related animal behaviors
- present the findings of a particular study of animal behavior
- account for a particular behavior observed in mammals
- question the evidence used to support a hypothesis about a particular animal behavior
- explain how the methodology of a particular study of animal behavior affected its findings

Explanation

Passage Description

The passage describes a single multiyear study of domestic dog behavior and discusses the researchers' initial assumptions as well as the study's eventual results.

Question Explanation

The passage is focused on a single, lengthy study of dog play behavior conducted by researchers Bauer and Smuts. The reader is given background information about previous studies, but the main focus is on the results of the Bauer and Smuts study. This points to **Choice 2** as the correct answer choice. The passage discusses play behavior in dogs, but does not seek to contrast different animal behaviors (Choice 1). The study in question focused on play behavior, but did not attempt to account for its existence (Choice 3). No specific evidence is called into question (Choice 4), nor is there any reference to the study's methodology affecting its findings (Choice 5).

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-18

It can be inferred from the passage that the “existing research” found which of the following about animals’ play behavior?

- Most animal species show significant sex differentiation when engaged in dyadic play.
- Dominant animals often appear to adjust their behavior during play in order to encourage subordinate partners to play with them.
- Larger, more experienced animals generally maintain their hierarchical roles in relation to smaller, younger animals during dyadic play.
- Few animal species that engage in dyadic play adhere closely to the 50:50 rule during play encounters.
- Some animal species show much more asymmetry during dyadic play than other species do.

Explanation

Passage Description

The passage describes a single multiyear study of domestic dog behavior and discusses the researchers’ initial assumptions as well as the study’s eventual results.

Question Explanation

The “existing research” is said to show that dominant individuals often engage in behavior that minimizes intimidation of their less-dominant play partner, which can reasonably be seen as a means of encouraging play. This points to **Choice 2** as the correct answer choice. While sex differences in play are mentioned elsewhere in the passage, the research noted here is not concerned with such differences (Choice 1). The research is said to reveal restraint on the part of more-dominant animals during play, a claim in opposition to the one made in Choice 3. If anything, the “existing research” implies that the 50:50 rule would be frequently rather than rarely followed (thus eliminating Choice 4), and there is no discussion of cross-species comparisons (Choice 5).

Difficulty level: 1 (1 = easy, 5 = hard)

Q's-19

Questions 9 to 12 are based on this passage.

undifferentiated by sex. They also predicted that the advantages imparted by larger relative size, by the experience of age, and by higher dominance status would affect dogs' dyadic play. Existing research on a variety of animal species suggests that individuals with such advantages often refrain from attacks and pursuits or engage in self-handicapping so as not to intimidate their play partners. If this held true for dogs, larger, older, more dominant dogs would show more self-handicapping than their partners. But Bauer and Smuts predicted instead that dogs would deviate from the hypothetical 50:50 rule, with advantaged individuals retaining their positions by performing the majority of attacks and pursuits and engaging in fewer self-handicapping behaviors than their partners, thus reinforcing existing hierarchies.

Bauer and Smuts' three-year study of dogs' dyadic play found that most dyads showed some degree of asymmetry (one dog winning more encounters than the other) and some dyads showed complete asymmetry. They also found that in general, older dogs performed more attacks and pursuits and that younger dogs engaged in more self-handicapping. Role reversal between dominant and subordinate individuals varied widely: several dyads never reversed dominance roles, a few reversed them frequently, and most reversed them occasionally.

Which of the following best describes the purpose of the highlighted sentence?

- It cites certain factors that Bauer and Smuts predicted would account for dogs' deviation from the 50:50 rule.
- It identifies certain expectations that Bauer and Smuts had at the beginning of their study of dogs' dyadic play.
- It explains what would occur if the subjects of Bauer and Smuts' study behaved like the subjects of the research mentioned in the previous sentence.
- It speculates about why the play behavior of dogs might resemble that of animal species previously studied.
- It challenges an assumption about the behavior of dominant dogs that had been held by many researchers.

Explanation

Passage Description

The passage describes a single multiyear study of domestic dog behavior and discusses the researchers' initial assumptions as well as the study's eventual results.

Question Explanation

The highlighted sentence refers to the "existing research" noted in the previous sentence, with "this" referring to the observed behavior of dominant animals during play. The sentence proposes that if the same were true of dogs in the Bauer and Smuts study, a particular outcome would be expected. This points to **Choice 3** as the correct answer choice. It is true that Bauer and Smuts predicted a deviation from the 50:50 rule, but the highlighted sentence does not explain that deviation (Choice 1), nor does it identify any specific expectations that Bauer and Smuts had when starting their study (Choice 2). The sentence does not speculate as to why dogs might behave in a certain way (Choice 4), and it also does not challenge any popular assumptions about animal behavior (Choice 5).

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-20

Questions 9 to 12 are based on this passage.

Observations of social play in several species of mammals indicate that individuals often depart from the usual social conventions by, for example, alternating dominant and subordinate positions in ways that do not occur outside the play context. Some researchers have even suggested that individuals must follow a 50:50 rule during dyadic play (play between two individuals), so that each participant wins an equal proportion of play encounters. Commonly cited cooperative tactics used to equalize play include self-handicapping (participants make themselves more vulnerable to attacks by their opponents) and role reversal (individuals that are dominant in the nonplay context appear subordinate during play). Where such tactics occur among unevenly matched opponents, they appear to facilitate play by making play more appealing to the less advantaged player.

When Bauer and Smuts set out to study play behavior in domestic dogs, they made several predictions. They expected to find no significant sex differences in dogs' play behavior. The motor skills dogs use in play fighting parallel those used in nonplayful aggression and hunting, areas in which dogs' behavior is relatively undifferentiated by sex. They also predicted that the advantages imparted by larger relative size, by the experience of age, and by higher dominance status would affect dogs' dyadic play. Existing research on a variety of animal species suggests that individuals with such advantages often refrain from attacks and pursuits or engage in

Which of the following can be inferred about the behavior of the dogs observed in Bauer and Smuts' study?

- The play behavior of most dogs remained constant from one encounter to another, regardless of the age of the play partner.
- A dog's play tactics were determined more by its partner's size and age than by its own size and age.
- Play among unevenly matched partners generally did not conform to the 50:50 rule postulated by some previous researchers.
- Older dogs almost never engaged in self-handicapping when playing with younger dogs.
- Most dogs engaged in dyadic play did not deviate from the roles of dominance and subordination that governed their behavior outside the play context.

Explanation

Passage Description

The passage describes a single multiyear study of domestic dog behavior and discusses the researchers' initial assumptions as well as the study's eventual results.

Question Explanation

The passage notes that during play most dyads showed "some" asymmetry and some showed "complete" asymmetry, whereas the 50:50 rule would predict equal outcomes. This points to **Choice 3** as the correct answer choice. No information is provided suggesting that the play behavior of most dogs remained consistent across encounters during the study (Choice 1), nor about dogs' apparent consideration of their own versus their play partner's size and age when determining play tactics (Choice 2). It is noted that older dogs engaged in less self-handicapping than younger dogs, but this is insufficient to imply that older dogs "almost never" engaged in that behavior (Choice 4). It is stated that "frequent role reversals" occurred during the study, which would contradict the claim in Choice 5.

Difficulty level: 3 (1 = easy, 5 = hard)

Section 2 : Quant

Q's-01

$$0 < x < y < 1$$

Quantity A

$$y - x$$

Quantity B

$$(x - y)^2$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

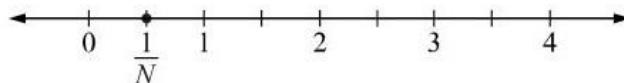
Since x and y are between 0 and 1 and since $y > x$, it follows that $y - x$ is between 0 and 1. Thus $(y - x)^2$ is less than $y - x$. Therefore Quantity B, $(x - y)^2$, which is equal to $(y - x)^2$, is less than Quantity A, $y - x$. The correct answer is **Choice 1**, that is, **Quantity A is greater**.

This explanation uses the following strategy.

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 2 (**1** = easy, **5** = hard)

Q's-02



Quantity A

$$N$$

Quantity B

$$\frac{1}{2}$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

From its position on the number line, you can see that $\frac{1}{N}$ is between 0 and 1. Therefore Quantity A, which is N , must be greater than 1.

Since Quantity B is $\frac{1}{2}$, it follows that the correct answer is **Choice 1**, that is, **Quantity A is greater**.

This explanation uses the following strategy.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-03

Last Monday, James paid \$8.00 per share for 180 shares of Stock X , paid \$10.00 per share for 160 shares of Stock Y , paid \$12.00 per share for 200 shares of Stock Z , and bought no other shares of stock.

Quantity A

The average (arithmetic mean) price per share that James paid for all of the shares of stock he bought last Monday

Quantity B

\$10.00

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

James bought 180 shares of Stock X at \$8.00 per share for a total of $(180)(\$8)$, or \$1,440. He also bought 160 shares of Stock Y at \$10 per share for a total of $(160)(\$10)$, or \$1,600, and 200 shares of Stock Z at \$12 per share for a total of $(200)(\$12)$, or \$2,400. In all, James bought a total of $180 + 160 + 200$, or 540, shares of stock for which he paid a total of $\$1,440 + \$1,600 + \$2,400$, or \$5,440. Therefore Quantity A, the average price per share for the 540 shares, is $\frac{\$5,440}{540}$, which is equal to \$10.07, rounded to the nearest \$0.01. This amount is slightly greater than Quantity B, \$10.00, so the correct answer is **Choice 1**, that is, **Quantity A is greater**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-04

$$\begin{aligned}2x + cy &= 10 \\6x + 2cy &= 40\end{aligned}$$

The system of equations shown has a solution, where c is a constant.

Quantity A

c

Quantity B

1

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

In this question, you are asked to compare the constant c with the number 1. To investigate c , you can try to solve the given system of equations as follows.

Multiply the first equation by 3 to get the following system.

$$\begin{aligned}6x + 3cy &= 30 \\6x + 2cy &= 40\end{aligned}$$

Then subtract the second equation from the new first equation to get $cy = -10$. From this equation, you can see that $c \neq 0$ and that $y = -\frac{10}{c}$. To solve for x , substitute $cy = -10$ in either equation of the system to get $x = 10$. This means that the system has the solution $(x, y) = \left(10, -\frac{10}{c}\right)$ only if c is not equal to 0.

Therefore c can be any number except 0, so c can be less than, equal to, or greater than 1. Thus the correct answer is **Choice 4**, that is, **The relationship cannot be determined from the information given.**

This explanation uses the following strategies.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 13: Determine Whether a Conclusion Follows from the Information Given

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-05

The average (arithmetic mean) of the 6 numbers q , r , s , t , u , and v is 36.

Quantity A

$$\frac{q}{6} + \frac{r}{6} + \frac{s}{6} + \frac{t}{6} + \frac{u}{6} + \frac{v}{6}$$

Quantity B

$$6$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

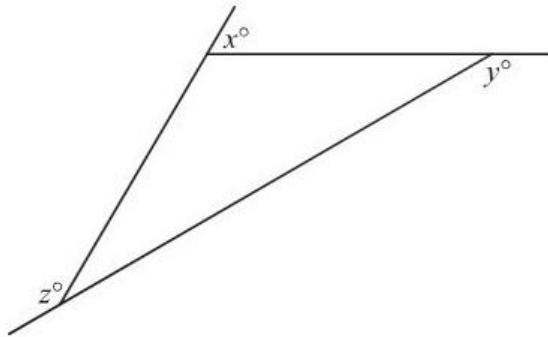
The average (arithmetic mean) of the 6 numbers is equal to $\frac{q+r+s+t+u+v}{6}$. This expression can be rewritten as $\frac{q}{6} + \frac{r}{6} + \frac{s}{6} + \frac{t}{6} + \frac{u}{6} + \frac{v}{6}$, which is Quantity A. It is given that the average is 36, so it follows that Quantity A is 36. Since Quantity B is 6, the correct answer is **Choice 1**, that is, **Quantity A is greater**.

This explanation uses the following strategy.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-06



Quantity A

$$x + y + z$$

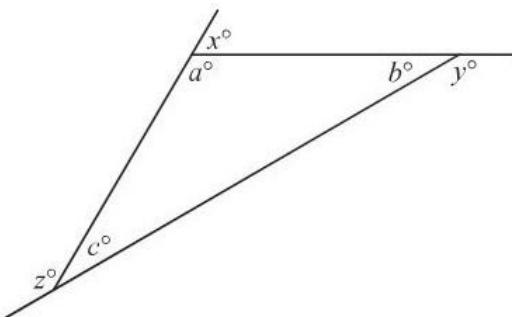
Quantity B

$$360$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

For the triangle shown, it is helpful to label the interior angles, say, a° , b° , and c° , since they are related to the corresponding exterior angles x° , y° , and z° , respectively.

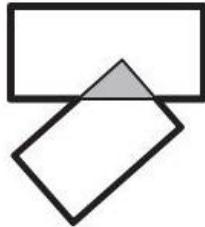


From the revised figure, since the three lines shown are straight, it follows that $x + a = 180$, $y + b = 180$, and $z + c = 180$. Therefore, using the fact that $a + b + c = 180$, Quantity A is equal to

$$\begin{aligned}x + y + z &= (180 - a) + (180 - b) + (180 - c) \\&= 540 - (a + b + c) \\&= 540 - 180 \\&= 360\end{aligned}$$

Thus the correct answer is **Choice 3**, that is, **The two quantities are equal**.

Q's-07



In the figure shown, two rectangular regions overlap to form a triangular region, which is shaded. The perimeters of the rectangles are 15 and 21, and the perimeter of the triangle is 6.

Quantity A

The sum of the lengths of the thick line segments

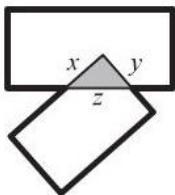
Quantity B

30

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

In the figure, it is helpful to label the lengths of the sides of the shaded triangular region, as follows.



You are given that the two rectangles have perimeters of 15 and 21, though it is not clear which rectangle has which perimeter. In one case, the sum of the lengths of the thick line segments is $(15 - z) + (21 - x - y)$, and in the other case, the sum is $(21 - z) + (15 - x - y)$. In either case, the sum is equal to $36 - (x + y + z)$.

Since you are given that the perimeter of the triangle is 6, that is, $x + y + z = 6$, it follows that Quantity A, the sum of the lengths of the thick line segments is $36 - 6$, or 30, which is Quantity B. Thus the correct answer is **Choice 3**, that is, **The two quantities are equal**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 6: Add to a Geometric Figure

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-08

x and y are integers.

$$2^x - 3y = 20$$

Quantity A

y

Quantity B

0

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

In this question, you are given that $2^x - 3y = 20$, where x and y are integers, and you are asked to compare y with 0. To find all possible values of y , note that the equation can be rewritten as $2^x = 20 + 3y$. Writing it this way, you can see that you are looking for integer values of y such that $20 + 3y$ is a positive integer that is a power of 2, where x is also an integer. The first few powers of 2 to consider are 1, 2, 4, 8, 16, and 32, and these can be checked one at a time to find possible values of y and compare them to 0.

When the first power of 2, which is 1, is written in the form of $20 + 3y$, it follows that $y = \frac{1 - 20}{3}$, which is not an integer and so should not be considered. The next power of 2 is 2, which can be written in the form $20 + 3(-6)$, where $y = -6$, which is an integer less than 0.

Can y be greater than 0? One way to explore that question is to start with $y = 1$ and see what happens. The integer $20 + 3(1)$, or 23, is not one of the powers of 2. However, if you sequentially increase y by 1, that is, start with 23 and count by 3, you can see that the next few possibilities are 26, 29, and 32, which is one of the powers of 2. Here, $32 = 20 + 3(4)$, so another possible value of y is 4, which is greater than 0. Since y can be less than 0 or greater than 0, the correct answer is **Choice 4**, that is, **The information cannot be determined from the information given**.

This explanation uses the following strategies.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 10: Trial and Error

Strategy 13: Determine Whether a Conclusion Follows from the Information Given

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-09

If x is 50 percent of y and if z is 30 percent of y , where $y > 0$, then z is what percent of x ?

60 %

Explanation

Since x is 50 percent of y and z is 30 percent of y , you have $x = (0.5)y$ and $z = (0.3)y$. To find z as a percent of x , divide z by x to get $\frac{z}{x} = \frac{(0.3)y}{(0.5)y} = 0.6$, or 60%. Thus z is 60% of x , and the correct answer is **60**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-10

A total of \$36,000 was invested for one month in a new money market account that paid simple annual interest at the rate of r percent. If the investment earned \$360 in interest for the month, what is the value of r ?

10.0

10.5

11.0

12.0

12.5

Explanation

The simple annual interest rate is r percent, so the interest rate for one month is r percent divided by 12 months, that is, $\frac{r}{100} \div 12$, or $\frac{r}{1,200}$. You are given that the \$36,000 investment earned \$360 in interest for the month, so $(\$36,000) \left(\frac{r}{1,200} \right) = \360 . Dividing this equation by \$360 yields $100 \left(\frac{r}{1,200} \right) = 1$, and solving for r yields $r = 12$. Thus the correct answer is **Choice 4**, that is, **12.0**.

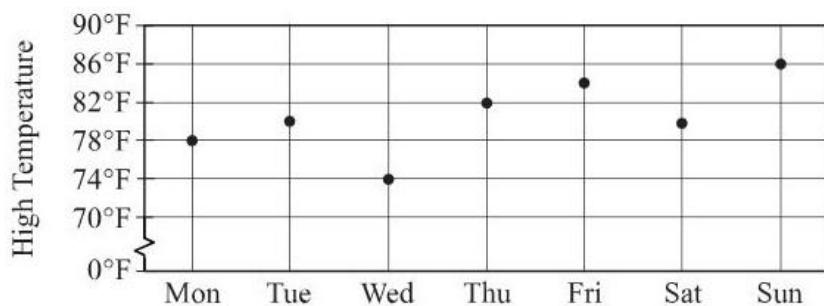
This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-11



The equation $C = \frac{5}{9}(F - 32)$ represents the relationship between temperature C in degrees Celsius and the corresponding temperature F in degrees Fahrenheit. The graph shows the high temperature, in degrees Fahrenheit, on each day of a certain week. Which of the following is closest to the range of the high temperatures for the week, in degrees Celsius?

4°C

7°C

8°C

12°C

14°C

Explanation

According to the graph, the greatest daily high temperature for the week is 86°F . The corresponding temperature in degrees Celsius is $\frac{5}{9}(86 - 32)$, or 30°C . The least daily high temperature for the week is 74°F . The corresponding temperature in degrees Celsius is $\frac{5}{9}(74 - 32)$, or about 23.3°C .

Therefore the range of the daily high temperatures is about $30^{\circ}\text{C} - 23.3^{\circ}\text{C}$, or 6.7°C . Of the answer choices given, 6.7°C is closest to 7°C . Thus the correct answer is **Choice 2**, that is, 7°C .

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-12

The circular bases of a right circular cylinder are inscribed in two opposite faces of a cube. If the volume of the cube is 64, which of the following is closest to the volume of the cylinder?

46

50

54

58

62

Explanation

The volume of the cube is 64. Therefore the length of each side is $\sqrt[3]{64}$, or 4. Since the circular bases of the cylinder are inscribed in two opposite faces of the cube, it follows that the height of the cylinder is 4 and the radius of each base of the cylinder is 2.

Note that the volume of a right circular cylinder is the product of the height and the area of a circular base, or $\pi(\text{radius})^2(\text{height})$. Hence, the volume of the given cylinder is equal to $\pi(2)^2(4) = 16\pi$, which is approximately equal to $(16)(3.14)$, or 50.24. Of the answer choices given, the closest is 50, so the correct answer is **Choice 2**, that is, 50.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-13

| Score Interval | Number of Students |
|----------------|--------------------|
| 90–100 | 5 |
| 80–89 | 8 |
| 70–79 | 10 |
| 60–69 | 2 |

All of the students in an English class took a test, and each student received a test score that was a whole number between 60 and 100, inclusive. The table shows the number of students who received a test score in each of four score intervals. Which of the following numbers could be the median test score for all of the students?

Indicate all such numbers.

- 85 80 75 70 65 60

Explanation

According to the table, the total number of students who took the test is 25. The median of 25 scores, ordered from lowest to highest, is the 13th score. You can see from the table that the 13th score is in the 80–89 score interval. Therefore any score from 80 to 89 could be the median. Thus the correct answer consists of **Choices 1 and 2**, that is, **85 and 80**.

This explanation uses the following strategy.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-14

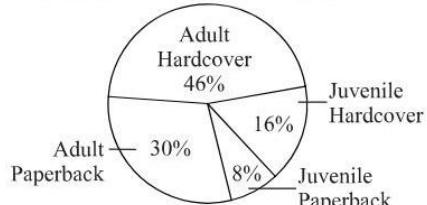
Questions 14 to 16 are based on the following data.

Book-Publishing Industry Sales in Region R

Summary of Book Sales for 2005, 2010, and 2015 (in millions of dollars)

| Market Category | 2005 | 2010 | 2015 |
|-----------------|-------|-------|-------|
| Mass-market | \$54 | \$93 | \$107 |
| Professional | \$41 | \$87 | \$105 |
| Other | \$146 | \$157 | \$198 |
| Total | \$241 | \$337 | \$410 |

Sales of Mass-Market Books by Age Level and Cover Type, 2015



For mass-market books in 2015, which of the following is closest to the ratio of the dollar amount of sales of adult hardcover books to the dollar amount of sales of juvenile hardcover books?

- 7 to 2
 5 to 2
 4 to 1
 3 to 1
 2 to 1

Explanation

The circle graph shows that in 2015, the dollar amount of sales of adult hardcover books was 46% of \$107 million, and the dollar amount of sales of juvenile hardcover books was 16% of \$107 million. Therefore the ratio of the dollar amount of sales of adult hardcover books to the dollar amount of sales of juvenile hardcover books is $\frac{(0.46)(107)}{(0.16)(107)} = \frac{46}{16}$, or 2.875 to 1. Of the answer choices given, the closest is 3 to 1, so the correct answer is **Choice 4**, that is, **3 to 1**.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-15

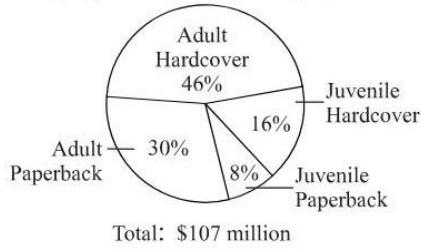
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| Mass-market | \$54 | \$93 | \$107 |
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| Other | \$146 | \$157 | \$198 |
| Total | \$241 | \$337 | \$410 |

Sales of Mass-Market Books by Age Level and Cover Type, 2015



For 2005, if sales of law books accounted for 39 percent of the dollar amount of sales of professional books, then sales of law books accounted for what percent of the dollar amount of all book sales for 2005?

Give your answer to the nearest whole percent.

7 %

Explanation

The table shows that in 2005, the dollar amount of sales of professional books was \$41 million. You are given that sales of law books accounted for 39% of that amount, which is $(0.39)(\$41)$ million, or \$15.99 million. The table also shows that the dollar amount of all book sales in 2005 was \$241 million.

Therefore, as a percent of \$241 million, sales of law books accounted for $\left(\frac{\$15.99}{\$241}\right)(100\%)$, or approximately 7%, to the nearest whole percent. Thus the correct answer is 7.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-16

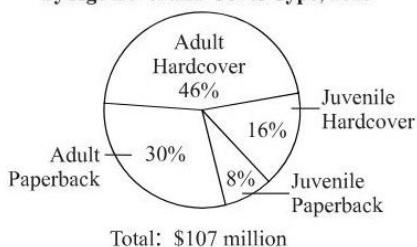
Questions 14 to 16 are based on the following data.

Book-Publishing Industry Sales in Region R

Summary of Book Sales for 2005, 2010, and 2015 (in millions of dollars)

| Market Category | 2005 | 2010 | 2015 |
|-----------------|-------|-------|-------|
| Mass-market | \$54 | \$93 | \$107 |
| Professional | \$41 | \$87 | \$105 |
| Other | \$146 | \$157 | \$198 |
| Total | \$241 | \$337 | \$410 |

Sales of Mass-Market Books by Age Level and Cover Type, 2015



If the sales of mass-market adult hardcover books accounted for 33 percent of mass-market book sales in 2010, by approximately what percent did the dollar amount of sales of this type of book increase from 2010 to 2015?

- 20%
- 30%
- 40%
- 50%
- 60%

Explanation

The table shows that in 2010, the dollar amount of sales of mass-market books was \$93 million. If sales of mass-market adult hardcover books accounted for 33% of this amount, then the dollar amount of sales of mass-market adult hardcover books in 2010 was $(0.33)(\$93)$ million, or \$30.69 million.

The circle graph shows that in 2015, the dollar amount of sales of mass-market adult hardcover books was 46% of \$107 million, which is $(0.46)(\$107)$ million, or \$49.22 million. Therefore the percent increase of the dollar amount of sales of mass-market adult hardcover books from 2010 to 2015 is given by $\left(\frac{\$49.22 - \$30.69}{\$30.69}\right)(100\%)$, or approximately 60.4%. Of the answer choices given, the closest is 60%, so the correct answer is **Choice 5**, that is, **60%**.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-17

The circumference of circle X is 24π . If the radius of circle Y is equal to $\frac{1}{12}$ of the circumference of circle X , what is the circumference of circle Y ?

- π
- 2π
- $2\pi^2$
- $4\pi^2$
- $2\pi^3$

Explanation

Given that the circumference of circle X is 24π and the radius of circle Y is $\frac{1}{12}$ of the circumference of circle X , it follows that the radius of circle Y is $\frac{1}{12}(24\pi)$, or 2π . The circumference of any circle with radius r is $2\pi r$. Therefore the circumference of circle Y is $2\pi(2\pi)$, or $4\pi^2$. The correct answer is **Choice 4**, that is, $4\pi^2$.

This explanation uses the following strategy.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-18

| Online News Source | Percent of Those Surveyed |
|------------------------------|---------------------------|
| Computer home page headlines | 52% |
| Newspaper website | 48% |
| News service website | 35% |
| Magazine website | 24% |
| Other | 20% |

In a study of online news sources, computer users were surveyed to determine what computer sources they used for online news. The responses of those surveyed are summarized in the table shown.

If 15 percent of those surveyed responded that they used both newspaper and magazine websites, what percent of those surveyed used newspaper websites but not magazine websites?

33 %

Explanation

The table shows that 48% of those surveyed used newspaper websites. It is given that 15% of those surveyed used both newspaper websites and magazine websites. So the percent of those surveyed who used newspaper websites but not magazine websites is $48\% - 15\%$, or 33%. The correct answer is **33**.

This explanation uses the following strategy.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-19

If $t \neq 0$, which of the following is equivalent to $\frac{1}{1 + \frac{1}{t + \frac{1}{t}}}$?

- A $\frac{1}{t}$ B $\frac{t}{t^2 + 1}$ C $\frac{t^2 + 1}{t}$ D $\frac{t}{t^2 + t + 1}$ E $\frac{t^2 + 1}{t^2 + t + 1}$

Explanation

Beginning with the fact that the expression $t + \frac{1}{t}$ is equivalent to $\frac{t^2 + 1}{t}$, the given expression can be simplified as follows.

$$\frac{1}{1 + \frac{1}{t + \frac{1}{t}}} = \frac{1}{1 + \frac{1}{\frac{t^2 + 1}{t}}} = \frac{1}{1 + \frac{t}{t^2 + 1}} = \frac{1}{\frac{t^2 + 1 + t}{t^2 + 1}} = \frac{t^2 + 1}{t^2 + t + 1}$$

Thus the correct answer is **Choice 5**, that is, $\frac{t^2 + 1}{t^2 + t + 1}$.

This explanation uses the following strategy.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-20

$$6 \leq |x| \leq 8$$

$$1 \leq |y| \leq 2$$

$$3 \leq |z| \leq 4$$

If x , y , and z satisfy the inequalities shown, what is the least possible value of $|x + y + z|$?

- A 0
 B 1
 C 2
 D 3
 E 4

Explanation

In this question, you are asked to find the least possible value of $|x + y + z|$. Recall that the absolute value of any number must be greater than or equal to 0. Therefore finding the least possible value of $|x + y + z|$ is the same as finding values of x , y , and z such that $x + y + z$ is as close to 0 as possible.

In an effort to form the sum $x + y + z$ that is as close to 0 as possible, look for both positive and negative values of x , y , and z that will cancel each other as much as possible. From the inequalities $1 \leq |y| \leq 2$, $3 \leq |z| \leq 4$, and $6 \leq |x| \leq 8$, note that $|y| < |z| < |x|$. So it is reasonable to begin building the sum $x + y + z$ by first choosing values that are closest to 0 for the largest term, $|x|$, and then to try to cancel with values of the smaller terms $|y|$ and $|z|$.

The two values of x that are closest to 0 are $x = 6$ and $x = -6$. If you choose $x = 6$, you need to find values of y and z that make the sum $6 + y + z$ as close to 0 as possible. Since $3 \leq |z| \leq 4$, you can choose $y = -2$ and $z = -4$, in which case the sum $6 + y + z$ is actually equal to 0. Alternatively, if you choose $x = -6$, by similar reasoning you can choose $y = 2$ and $z = 4$, in which case the sum is also 0. Since $|x + y + z|$ cannot be less than 0 and in the two cases above it is equal to 0, the least possible value of $|x + y + z|$ is 0. The correct answer is **Choice 1**, that is, 0.

This explanation uses the following strategies.

Strategy 10: Trial and Error

Strategy 11: Divide into Cases

Difficulty level: 4 (1 = easy, 5 = hard)

Section 3 : Verbal

Q's-01

Theories about the interaction between people and their environment in the workplace have been prevalent in the management literature for almost a hundred years, making this one of the more _____ lines of psychological theorizing.

| |
|-------------|
| ambitious |
| haphazard |
| provocative |
| elusive |
| venerable |

Explanation

Question Explanation

This question requires that we understand the implication of having been “prevalent . . . for almost a hundred years.” The best answer choice is “venerable,” since it clearly conveys the sense of a long history. None of the other answer choices is well supported by the context of the sentence.

Thus the correct answer is **venerable**.

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-02

The argument that some knowledge can be derived without appealing to facts about the world seems tenable: there are many examples, drawn from mathematics and logic, of knowledge that does not appear to be _____.

| |
|------------|
| empirical |
| plausible |
| axiomatic |
| conveyable |
| immutable |

Explanation

Question Explanation

The second part of the sentence is intended to support the first; the “many examples,” then, would be examples of knowledge that was “derived without appealing to facts about the world.” Since there is negation before the blank, the word that appears in the blank must mean “derived by appealing to facts about the world.” The word that satisfies this requirement is “empirical.”

Thus the correct answer is **empirical**.

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-03

The strategists who created the European Union practiced piecemeal social engineering. Recognizing that perfection is (i)_____, they set limited objectives then mobilized the political will for a small step forward knowing full well that when they achieved it, its (ii)_____ would become apparent and necessitate further measures.

| | |
|--------------|------------|
| Blank (i) | Blank (ii) |
| unattainable | potential |
| indisputable | inadequacy |
| ephemeral | resilience |

Explanation

Question Explanation

The correct answer choice for Blank (i) must be “unattainable,” since someone “sets limited objectives” and attempts to make “a small step forward” when “perfection” would appear to be out of reach. “Ephemeral” does not quite capture that sense, because one could well strive to achieve perfection while knowing that it would last only a short time. As for Blank (ii), the only answer choice that would *necessitate* further measures is “inadequacy”: recognizing unrealized “potential” might *warrant* further action, but would not require it.

Thus the correct answer is **unattainable** and **inadequacy**.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's–04

The novel is a stylistic (i)_____ sparse, vivid, and gripping. But it is limited by the (ii)_____ of its characters, who are as two-dimensional as the lives they are leading.

| Blank (i) | Blank (ii) |
|----------------|-------------|
| hodgepodge | audacity |
| triumph | incongruity |
| anomaly | shallowness |

Explanation

Question Explanation

The adjectives after Blank (i) convey positive attributes; furthermore, the beginning of the next sentence, “But it is limited by . . . ,” implies that the word in Blank (i) is in contrast with a negative feature. Thus, the correct answer for Blank (i) must be “triumph.” The answer for Blank (ii) must be negative (something that “limits” a novel); the word “two-dimensional” suggests “shallowness” as the correct choice. “Incongruity,” while also a negative term, is not supported by the context.

Thus the correct answer is **triumph** and **shallowness**.

Difficulty level: 3 (1 = easy, 5 = hard)

Q's–05

During the 1970s, the university's first president brought about (i)_____ changes in the institution. Indeed, so (ii)_____ was the transformation that subsequent administrators have been in the fortunate position of being unable to (iii)_____ the kind of challenges she once faced.

| Blank (i) | Blank (ii) | Blank (iii) |
|--------------------|-----------------|-------------|
| disconcerting | detrimental | imagine |
| fundamental | acclaimed | forestall |
| superfluous | profound | ignore |

Explanation

Question Explanation

The fact that Blank (i) modifies “changes,” Blank (ii) modifies “transformation,” and there is the phrase “Indeed, so” between them suggests that the answer choices for Blanks (i) and (ii) must convey different degrees of the same general attribute. This points to “fundamental” and “profound” as the correct answer choices. While “disconcerting” and “detrimental” might also function in this way, their meaning is in contrast with the idea that subsequent administrators found themselves in a “fortunate position.” For Blank (iii), the inability to “forestall” or to “ignore” challenges certainly isn’t “fortunate,” so the correct choice for Blank (iii) is “imagine.”

Thus the correct answer is **fundamental**, **profound**, and **imagine**.

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-06

The building's address at 88 East Broadway is an ostensibly (i)_____ one. In Chinese numerology, 88 means "double prosperity," but this meaning becomes (ii)_____ when one considers how few of the businesses in the building could be described as (iii)_____.

Blank (i)

| |
|------------|
| foreboding |
| irrelevant |
| auspicious |

Blank (ii)

| |
|-------------|
| underscored |
| manifest |
| incongruous |

Blank (iii)

| |
|-------------|
| successful |
| traditional |
| fashionable |

Explanation

Question Explanation

This question might best be addressed by starting with Blank (ii). The "but" in the second sentence implies a contrast with a positive meaning of "88" ("double prosperity"), so the correct choice for Blank (ii) should be negative. Thus, the only plausible choice is "incongruous." For Blank (iii), the word "few" indicates that the correct choice should fit the "double prosperity" meaning, so the best answer here is "successful" ("fashionable" is also positive, but being fashionable does not necessarily imply prosperity). For Blank (i), the word "ostensibly" (that is, seemingly, but not in reality) tells us that the correct choice is "auspicious"—the building's address appears to be auspicious, but the reality is quite different.

Thus the correct answer is **auspicious, incongruous, and successful**.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-07

Questions 7 and 8 are based on this passage.

This passage is adapted from material published in 2000.

Many cultural anthropologists have come to reject the scientific framework of empiricism that dominated the field until the 1970s and now regard all scientific knowledge as socially constructed. They argue that information about cultures during the empiricist era typically came from anthropologists who brought with them a prepackaged set of conscious and unconscious biases. Cultural anthropology, according to the post-1970s critique, is unavoidably subjective, and the anthropologist should be explicit in acknowledging that fact. Anthropology should stop striving to build a better database about cultural behavior and should turn to developing a more humanistic interpretation of cultures. The new framework holds that it may be more enlightening to investigate the biases of earlier texts than to continue with empirical methodologies.

The author implies which of the following about most cultural anthropologists working prior to the 1970s?

- They argued that scientific knowledge was socially constructed.
- They were explicit in acknowledging the biases inherent in scientific investigation.
- They regarded scientific knowledge as consisting of empirical truths.
- They shared the same conscious and unconscious biases.
- They acknowledged the need for a new scientific framework.

Explanation

Passage Description

The passage describes how the views of cultural anthropologists regarding the subjectivity of their field have changed since the 1970s.

Question Explanation

The passage refers to the “framework of empiricism that dominated the field until the 1970s” and says that it was rejected in favor of the view that “all scientific knowledge [is] socially constructed.” This implies that before the 1970s, scientific knowledge was regarded as empirical, pointing to **Choice 3** as the correct answer choice. Choices 1 and 2 describe cultural anthropologists after this shift rather than those working before the 1970s, so they are incorrect. The passage does not compare the conscious and unconscious biases of anthropologists of any era (Choice 4), nor does it suggest that anthropologists working before the 1970s saw a need for a new scientific framework (Choice 5).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's–08

Questions 7 and 8 are based on this passage.

This passage is adapted from material published in 2000.

Many cultural anthropologists have come to reject the scientific framework of empiricism that dominated the field until the 1970s and now regard all scientific knowledge as socially constructed. They argue that information about cultures during the empiricist era typically came from anthropologists who brought with them a prepackaged set of conscious and unconscious biases. Cultural anthropology, according to the post-1970s critique, is unavoidably subjective, and the anthropologist should be explicit in acknowledging that fact. Anthropology should stop striving to build a better database about cultural behavior and should turn to developing a more humanistic interpretation of cultures. The new framework holds that it may be more enlightening to investigate the biases of earlier texts than to continue with empirical methodologies.

According to the passage, “many cultural anthropologists” today would agree that anthropologists should

- build a better, less subjective database about cultural behavior
- strive to improve the empirical methodologies used until the 1970s
- reject the notion that scientific knowledge is socially constructed
- turn to examining older anthropological texts for unacknowledged biases
- integrate humanistic interpretations with empirical methodologies

Explanation

Passage Description

The passage describes how the views of cultural anthropologists regarding the subjectivity of their field have changed since the 1970s.

Question Explanation

The passage states that the newer approach to cultural anthropology “holds that it may be more enlightening to investigate the biases of earlier texts than to continue with empirical methodologies.” This points to **Choice 4** as the correct answer choice. Choices 1 and 3 are the opposite of what today’s cultural anthropologists espouse: their critique holds that “anthropology should stop trying to build a better database” (Choice 1), and their approach embraces the notion that scientific knowledge is socially constructed (Choice 3). The new approach does not seek to integrate or improve old empirical methodologies (Choices 2 and 5); instead, it rejects them outright.

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-09

Questions 9 to 11 are based on this passage.

Projecting the idea of a distinctive female demand in seventeenth- and eighteenth-century England was a groundbreaking departure in the history of marketing. The pioneers were the booksellers and printers who addressed specialist titles to the ladies in the 1600s, while the post-1688 print boom saw the publication of custom-designed ladies' pocket diaries, a proliferation of female manuals of all kinds, the *Female Spectator* in the 1740s and the long-running *Lady's Magazine* from 1770. The leap to objects was made when leading furniture makers started classifying furniture by the sex, age, and specialist needs of the implied user in the new illustrated catalogs of the 1760s. Of course, sex distinctions in clothes are as old as civilization, while the idea of furniture suited to female needs is not unprecedented (think of birthing stools), but making difference systematic and concrete by means of word, image, and object was a decisive innovation. The rapid diffusion of ladies' and gentlemen's furniture suggests that gender distinctions already resonated powerfully with male and female consumers, but in the extension of the range of differentiated furniture, the projection of the trope by manufacturers thereafter, and its acceptance by consumers, conventional ideas of masculine importance and feminine delicacy were amplified and fixed. In the process, femininity was expressed in a specific and narrowly defined aesthetic register.

According to the passage, which of the following is true about furniture prior to the 1760s?

- Some furniture made specifically for women already existed.
- Most furniture design was already influenced by women's preferences.
- Custom-designed furniture was rare.
- The range of available furniture was small.
- Advertising had rarely been used to generate consumer demand for furniture.

Explanation

Passage Description

The passage discusses the marketing of products designed specifically for women, focusing on its origins and rise in England during the 1600s and 1700s.

Question Explanation

When referencing the new catalogs of the 1760s that classified furniture by sex, the passage cites birthing stools as evidence that "the idea of furniture suited to female needs is not unprecedented." This points to **Choice 1** as the correct answer choice. While the passage states that furniture was classified differently after 1760s, it doesn't follow that the range of furniture offered before then was small (Choice 4). The passage makes no distinction between custom-designed and mass-market furniture (Choice 3), nor does it make reference to women's preferences influencing furniture design (Choice 2). Although the passage implies that illustrated catalogs were new in the 1760s, that does not mean that furniture advertising itself was rare before that time (Choice 5).

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-10

Questions 9 to 11 are based on this passage.

Projecting the idea of a distinctive female demand in seventeenth- and eighteenth-century England was a groundbreaking departure in the history of marketing. The pioneers were the booksellers and printers who addressed specialist titles to the ladies in the 1600s, while the post-1688 print boom saw the publication of custom-designed ladies' pocket diaries, a proliferation of female manuals of all kinds, the *Female Spectator* in the 1740s and the long-running *Lady's Magazine* from 1770. The leap to objects was made when leading furniture makers started classifying furniture by the sex, age, and specialist needs of the implied user in the new illustrated catalogs of the 1760s. Of course, sex distinctions in clothes are as old as civilization, while the idea of furniture suited to female needs is not unprecedented (think of birthing stools), but making difference systematic and concrete by means of word, image, and object was a decisive innovation. The rapid diffusion of ladies' and gentlemen's furniture suggests that gender distinctions already resonated powerfully with male and female consumers, but in the extension of the range of differentiated furniture, the projection of the trope by manufacturers thereafter, and its acceptance by consumers, conventional ideas of masculine importance and feminine delicacy were amplified and fixed. In the process, femininity was expressed in a specific and narrowly defined aesthetic register.

Which of the following statements best describes the function of the highlighted sentence in the context of the passage as a whole?

- It mitigates a claim that was presented in the first sentence of the passage.
- It interprets an example that was introduced in the first sentence of the passage.
- It provides historical context for the phenomenon that is analyzed in the remainder of the passage.
- It introduces a distinction between two historical approaches that the remainder of the passage elaborates on.
- It gives an overview of a historical development that the rest of the passage explores in more detail.

Explanation

Passage Description

The passage discusses the marketing of products designed specifically for women, focusing on its origins and rise in England during the 1600s and 1700s.

Question Explanation

The highlighted sentence identifies booksellers as pioneers in marketing specialized products to women and lists titles and products that support this claim. The remainder of the passage discusses the spread of this sort of marketing to furniture. Since bookselling provides a precedent and frame of reference for the furniture marketing that followed it, **Choice 3** is the correct answer choice. Book marketing is presented as an early example of the phenomenon mentioned in the passage's first sentence, but nothing about the highlighted portion mitigates (Choice 1) or interprets (Choice 2) portions of the first sentence. There is no reference to historical approaches in the highlighted portion (Choice 4). Since it also makes no mention of furniture marketing, it cannot be construed as an overview of the remainder of the passage (Choice 5).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-11

Questions 9 to 11 are based on this passage.

Projecting the idea of a distinctive female demand in seventeenth- and eighteenth-century England was a groundbreaking departure in the history of marketing. The pioneers were the booksellers and printers who addressed specialist titles to the ladies in the 1600s, while the post-1688 print boom saw the publication of custom-designed ladies' pocket diaries, a proliferation of female manuals of all kinds, the *Female Spectator* in the 1740s and the long-running *Lady's Magazine* from 1770. The leap to objects was made when leading furniture makers started classifying furniture by the sex, age, and specialist needs of the implied user in the new illustrated catalogs of the 1760s. Of course, sex distinctions in clothes are as old as civilization, while the idea of furniture suited to female needs is not unprecedented (think of birthing stools), but making difference systematic and concrete by means of word, image, and object was a decisive innovation. The rapid diffusion of ladies' and gentlemen's furniture suggests that gender distinctions already resonated powerfully with male and female consumers, but in the extension of the range of differentiated furniture, the projection of the trope by manufacturers thereafter, and its acceptance by consumers, conventional ideas of masculine importance and feminine delicacy were amplified and fixed. In the process, femininity was expressed in a specific and narrowly defined aesthetic register.

The author of the passage would most likely agree with which of the following statements regarding the effect of marketing gender-differentiated furniture?

- It introduced new ideas of femininity and masculinity to consumers.
- It was more successful than was the marketing of age-differentiated furniture.
- It undermined conventional ideas of masculine importance.
- It contributed to an increase in custom-designed furniture.
- It promulgated a limited definition of femininity.

Explanation

Passage Description

The passage discusses the marketing of products designed specifically for women, focusing on its origins and rise in England during the 1600s and 1700s.

Question Explanation

The passage states that in the marketing of gender-specific furniture and its acceptance by consumers, "femininity was expressed in a . . . narrowly defined aesthetic register." The phrase "narrowly defined" points to **Choice 5** as the correct answer choice. The passage asserts that the success of gender-specific marketing, rather than introducing new ideas of masculinity and femininity (Choice 1), "suggests that gender distinctions already resonated powerfully with male and female consumers." The passage also suggests that such marketing "amplified and fixed" those notions of gender that already existed, rather than undermining them (Choice 3). The passage makes no comparison between the marketing of gender-differentiated and age-differentiated furniture (Choice 2), nor does it make any claims about custom-designed furniture (Choice 4).

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-12

Today the writer's prodigious output of prose and poetry enjoys _____ notice, but in his lifetime his works commanded huge sales in Italy and abroad.

- limited
- vigorous
- occasional
- sporadic
- dutiful
- lively

Explanation

Question Explanation

The “but” that begins the second clause of the sentence indicates that the correct answer must establish some kind of contrast with the “huge” sales that the writer commanded during his lifetime. The best pair of choices is “occasional” and “sporadic”; if the writer today enjoys only “occasional” notice, then he is presumably not commanding huge sales in Italy and elsewhere. “Limited” nicely fits the meaning of the sentence, but there’s no other word that matches it in meaning. “Vigorous” and “lively” are synonymous, but they do not fit the meaning of the sentence.

Thus the correct answer is **occasional** (Choice 3) and **sporadic** (Choice 4).

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-13

Unlike the violent thunderstorms of summer, which _____ water in widely scattered downpours, winter rains in the Sonoran Desert come in a gradual procession, soaking into the land and swelling every desert pore with liquid life.

- channel
- disgorge
- direct
- dump
- collect
- concentrate

Explanation

Question Explanation

The “unlike” at the beginning of the sentence suggests that the word in the blank contrasts with the idea of “a gradual procession.” The only pair of answer choices that conveys such a contrast is “disgorge” and “dump”: both terms have connotations of suddenness. “Channel” and “direct” create sentences that are alike in meaning, as do “collect” and “concentrate,” but neither of these pairs provides the necessary contrast with “gradual.”

Thus the correct answer is **disgorge** (Choice 2) and **dump** (Choice 4).

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-14

When the Spanish brought potatoes to Europe in the sixteenth century, the locals were _____, in part because they found potatoes to be unsightly.

- unimpressed
- skeptical
- indignant
- contrite
- distracted
- preoccupied

Explanation

Question Explanation

“Unsightly” at the end of the sentence indicates that the word in the blank should have a negative connotation. The only pair of negative synonyms among the answer choices is “unimpressed” and “skeptical.” “Indignant” is also negative, but no other answer choice would produce a second sentence with the same meaning.

Thus the correct answer is **unimpressed** (Choice 1) and **skeptical** (Choice 2).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-15

The Leipzig academy for painting and architecture opened in 1764, but its emphasis, in keeping with the city's _____ attitude, had become more practical by the end of the nineteenth century.

- idealistic
- businesslike
- hands-off
- ambitious
- no-nonsense
- noninterventionist

Explanation

Question Explanation

The words that fill the blank must describe an attitude that is congruent with the academy's practical emphasis. "Businesslike" and "no-nonsense" are both synonyms for "practical," so they best fit the meaning of the sentence. "Noninterventionist" and "hands-off" both refer to a level of control, so they are not congruent with being practical. "Idealistic" can mean the opposite of practical, so it does not work. "Ambitious" refers to the loftiness of aims, so it does not fit either.

Thus the correct answer is **businesslike** (Choice 2) and **no-nonsense** (Choice 5).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-16

Question 16 is based on this passage.

Historian : Plato, writing in the fourth century B.C., describes an island he calls Atlantis, where an ancient civilization, famous for pottery made from clay of an unusual shade of red, flourished before being destroyed by volcanic eruptions. It has traditionally been held that Atlantis is entirely a creation of Plato's imagination. However, archaeologists now believe that volcanic eruptions destroyed a civilization on a Greek island today called Santorini roughly when Plato's Atlantis was supposedly destroyed. And because Santorini also has unusual red clay deposits, some scholars now contend that Santorini was Plato's Atlantis. Yet the fact remains that writers before Plato never mention an Atlantis-like civilization. Since they would certainly have done so if such a civilization had existed, the traditional view is surely correct.

In the historian's argument, the two portions highlighted play which of the following roles?

- The first is a position that the historian considers; the second states the historian's conclusion concerning that position.
- The first is a position that the historian rejects; the second is a conclusion drawn to justify that rejection.
- The first presents a position that is upheld by the historian; the second presents the historian's conclusion concerning a different position.
- The first presents evidence in support of the historian's conclusion; the second presents that conclusion.
- The first is a position that the historian evaluates; the second provides evidence to support the historian's assessment of that position.

Explanation

Passage Description

The historian states that Atlantis has been traditionally considered an imaginary creation of Plato, considers evidence countering that traditional interpretation, and ultimately affirms the traditional view as correct.

Question Explanation

The first highlighted portion is a statement of the traditional view of Atlantis. The passage considers this traditional view before reaffirming it in the second highlighted portion. **Choice 1** is therefore correct. The historian does not reject the traditional view that is stated in the first highlighted portion (Choice 2); the first highlighted portion also presents no evidence but is merely a statement (Choice 4). While the first parts of answer choices 3 and 5 are accurate—the first highlighted portion presents a position that is upheld by the historian and is a position that the historian evaluates—the second parts of both answer choices are incorrect. The historian ultimately upholds the position stated in the first highlighted portion, not a different one (Choice 3), and the second highlighted portion contains no evidence, just a conclusion (Choice 5).

Difficulty level: 2 (1 = easy, 5 = hard)

Q's–17

Questions 17 and 18 are based on this passage.

Octopuses show surprising cognitive abilities: solving mazes, learning cues, and remembering solutions. Furthermore, recent studies suggest that octopuses may display the first “personalities” ever measured in an invertebrate: confronted with the same threats and food stimuli, individual octopuses react differently. Until recently, such traits were thought to be exclusive to higher vertebrates and to develop primarily among long-lived, social animals. Longevity, it was thought, justifies the biological “investment” in big, complex brains. Why would the short-lived, solitary octopus develop such traits? Mather postulates that animals that pursue varied food sources in changeable, perilous habitats must develop a wide range of hunting and defensive strategies. Variation in the temperament of individuals enhances survival in a volatile, competitive milieu by ensuring that different individuals respond differently to changing conditions so some will thrive.

Which of the following best describes the function of the highlighted sentence?

- It articulates a conjecture central to Mather’s theory.
- It identifies a trait that is thought to be unique to social species.
- It presents evidence that undermines a formerly widely held view.
- It explains the logic underlying a view that has recently been challenged.
- It points out a crucial distinction between cognitively complex species and other species.

Explanation

Passage Description

The passage discusses two surprising aspects of octopus cognition and explains Mather’s theory about their function.

Question Explanation

The sentence before the highlighted portion states that cognitive complexity and personality were once thought to occur only among long-lived, social vertebrates. The highlighted sentence explains why people thought longevity was required for the development of a complex brain. Since octopuses are subsequently described as short-lived and solitary, the existence of these traits in octopuses must challenge that theory. **Choice 4** is thus the correct answer choice.

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-18

Questions 17 and 18 are based on this passage.

Octopuses show surprising cognitive abilities: solving mazes, learning cues, and remembering solutions. Furthermore, recent studies suggest that octopuses may display the first “personalities” ever measured in an invertebrate: confronted with the same threats and food stimuli, individual octopuses react differently. Until recently, such traits were thought to be exclusive to higher vertebrates and to develop primarily among long-lived, social animals. Longevity, it was thought, justifies the biological “investment” in big, complex brains. Why would the short-lived, solitary octopus develop such traits? Mather postulates that animals that pursue varied food sources in changeable, perilous habitats must develop a wide range of hunting and defensive strategies. Variation in the temperament of individuals enhances survival in a volatile, competitive milieu by ensuring that different individuals respond differently to changing conditions so some will thrive.

It can be inferred that prior to the findings on octopuses discussed in the passage, a dominant view held that

- hunting and defensive strategies are unrelated to brain size
- longevity has no relation to a species’ development of advanced cognitive skills
- in changeable, perilous habitats, social animals are better able to survive than solitary animals
- the behavior of invertebrates of the same species is likely to vary little in response to a particular stimulus
- individuals of an invertebrate species and individuals of a vertebrate species are equally likely to display individual “personalities”

Explanation

Passage Description

The passage discusses two surprising aspects of octopus cognition and explains Mather’s theory about their function.

Question Explanation

The colon in the passage’s second sentence indicates that the second half will explain or offer proof for the assertion made in the first half. The differing reactions of individual octopuses when confronted with similar stimuli, then, is cited as evidence for the existence of personalities in invertebrates. Since these personalities are described as the first ever measured in an invertebrate, it can be assumed that previous experiments on invertebrates did not find differences in individual reactions to the same stimuli. This points to **Choice 4** as the correct answer choice. Choices 2 and 5 are the opposite of what was assumed before the octopus experiments: cognitive skills were thought to “be exclusive to higher vertebrates” (Choice 5) and “develop primarily among long-lived” animals (Choice 2). There is no mention of a dominant view about the relationship between hunting skills and brain size (Choice 1) or about survival rates of social and solitary animals (Choice 3).

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-19

Questions 19 and 20 are based on this passage.

This passage is adapted from material published in 2002.

In 1971, hot on the heels of plate-tectonic theory’s acceptance, J. W. Morgan suggested that hotspots—areas of intense volcanism such as Hawaii, Yellowstone, and Iceland—are fueled by plumes of hot material arising in the deep mantle and punching through the mobile shallow mantle and crust to the surface. Morgan’s theory was developed to explain the time-progressive trails of volcanoes associated with some hotspots and the hotspots’ apparent fixity relative to one another. If the sources of the volcanism were rooted in the immobile deep mantle, they would not move relative to one another and the plates at the surface would drift above, bearing away trails of volcanism. According to a recent article by geologist G. R. Foulger, however, although hotspots do exist, they do not have time-progressive volcanic trails and are not fixed relative to one another.

The passage implies that Morgan’s suggestion was

- presented as a challenge to a newly accepted theory
- made on the basis of considerations that have since been questioned
- rejected despite its success in explaining the phenomena it was intended to explain
- supplanted by a theory that was more general in scope
- intended to account for observations that appeared to contradict an accepted theory

Explanation

Passage Description

The passage uses concepts of plate tectonics to explain Morgan's hypothesis about hotspots before suggesting that more recent data contradicts the purported phenomena that his hypothesis explains.

Question Explanation

Morgan's supposition grew out of two supposed characteristics of hotspots, their relative fixity and the time-progressive volcano trails. Since Foulger rejects both characteristics, **Choice 2** is correct. There is no sign that Morgan's suggestion was a challenge to any theory (Choice 1), nor that it was rejected despite its success (Choice 3). There is no mention of a theory that supplanted it (Choice 4), nor that the observations that it explains contradict any theory (Choice 5).

Difficulty level: 4 (1 = easy, 5 = hard)

Q's–20

Questions 19 and 20 are based on this passage.

This passage is adapted from material published in 2002.

In 1971, hot on the heels of plate-tectonic theory's acceptance, J. W. Morgan suggested that hotspots—areas of intense volcanism such as Hawaii, Yellowstone, and Iceland—are fueled by plumes of hot material arising in the deep mantle and punching through the mobile shallow mantle and crust to the surface. Morgan's theory was developed to explain the time-progressive trails of volcanoes associated with some hotspots and the hotspots' apparent fixity relative to one another. If the sources of the volcanism were rooted in the immobile deep mantle, they would not move relative to one another and the plates at the surface would drift above, bearing away trails of volcanism. According to a recent article by geologist G. R. Foulger, however, although hotspots do exist, they do not have time-progressive volcanic trails and are not fixed relative to one another.

Which of the following best describes the function of the highlighted sentence?

- It points out some unintended consequences of a theory.
- It elucidates the thinking behind Morgan's suggestion.
- It explains why the theory of plate tectonics had been accepted.
- It expresses the author's attitude toward Morgan's suggestion.
- It introduces an alternative to Morgan's suggested explanation.

Explanation

Passage Description

The passage uses concepts of plate tectonics to explain Morgan's hypothesis about hotspots before suggesting that more recent data contradicts the purported phenomena that his hypothesis explains.

Question Explanation

Morgan hypothesized that the sources of volcanic activity are rooted in the deep mantle, and the highlighted portion explains the consequences of that hypothesis. These consequences include hotspots that are fixed relative to one another but moving in paths relative to the surface of Earth—the very things that Morgan's hypothesis is intended to explain. By elucidating how Morgan's hypothesis explains this data, the highlighted sentence suggests the reasoning behind it, pointing to **Choice 2** as the correct answer choice.

Difficulty level: 3 (1 = easy, 5 = hard)

Section 4 : Quant

Q's-01

List K consists of the four numbers w , x , y , and z . List M consists of the four numbers $w + 5$, $x + 5$, $y + 5$, and $z + 5$.

Quantity A

The standard deviation of the numbers in list K

Quantity B

The standard deviation of the numbers in list M

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

Recall that the standard deviation of the numbers in a list is a measure of the spread of the numbers about the mean of the numbers. Note that list M is formed by adding the same number, 5, to each number in list K . Thus the mean of the numbers in list M is 5 more than the mean of the numbers in list K , but the spread of the numbers in list M about the mean of the numbers in list M is the same as the spread of the numbers in list K about the mean of the numbers in list K . Thus the standard deviations of the two lists are the same, and correct answer is **Choice 3**, that is, **The two quantities are equal**.

This explanation uses the following strategy.

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-02

A car traveled at a constant speed of 48 kilometers per hour for 3 kilometers.

Quantity A

The time, in minutes, it took for the car to travel the 3 kilometers

Quantity B

3.75 minutes

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

You are given that a car traveled at a constant rate of 48 kilometers per hour for a distance of 3 kilometers. Using t to represent the number of hours it took the car to travel the 3 kilometers and the fact that distance equals rate multiplied by time, you have

$$(48 \text{ kilometers per hour})(t \text{ hours}) = 3 \text{ kilometers}$$

Thus it took the car $\frac{3}{48}$, or $\frac{1}{16}$ hour, to travel 3 kilometers at a constant speed of 48 kilometers per hour. Since there are 60 minutes in an hour, Quantity A, the number of minutes it took the car to travel 3 kilometers at this speed, is $\left(\frac{1}{16}\right)(60)$, or 3.75. Since Quantity B is also 3.75, the correct answer is **Choice 3**, that is, **The two quantities are equal**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 2 (1 = easy, 5 = hard)

Q's-03

n is a positive integer.

Quantity A

$$\frac{1}{3^n}$$

Quantity B

$$3\left(\frac{1}{7^n}\right)$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

In this question, you are given that n is a positive integer and you are asked to compare Quantity A, $\frac{1}{3^n}$, with Quantity B, $3\left(\frac{1}{7^n}\right)$. To explore the relationship between Quantity A and Quantity B, try a few small values of the positive integer n and compare the values of Quantities A and B.

If $n = 1$, then Quantity A is $\frac{1}{3}$ and Quantity B is $\frac{3}{7}$. So Quantity B is greater than Quantity A.

If $n = 2$, then Quantity A is $\frac{1}{3^2}$, or $\frac{1}{9}$, and Quantity B is $\frac{3}{7^2}$, or $\frac{3}{49}$. So Quantity A is greater than Quantity B.

Since Quantity B is greater when $n = 1$ and Quantity A is greater when $n = 2$, the correct answer is **Choice 4**, that is, **The relationship cannot be determined from the information given**.

This explanation uses the following strategies.

Strategy 10: Trial and Error

Strategy 13: Determine Whether a Conclusion Follows from the Information Given

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-04

$$x = \frac{1}{2}$$

Quantity A

$$5x^{-3} - 9x^{-2}$$

Quantity B

$$4$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

In this question, you are given that $x = \frac{1}{2}$, where Quantity A is the expression $5x^{-3} - 9x^{-2}$ and Quantity B is 4. To compare the quantities, substitute $x = \frac{1}{2}$ into $5x^{-3} - 9x^{-2}$ and simplify the result as follows.

$$5\left(\frac{1}{2}\right)^{-3} - 9\left(\frac{1}{2}\right)^{-2} = 5(8) - 9(4) = 40 - 36 = 4$$

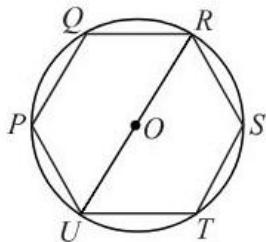
Thus the value of Quantity A is 4, as is Quantity B, so the correct answer is **Choice 3**, that is, **The two quantities are equal**.

This explanation uses the following strategy.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-05



In the figure shown, hexagon $PQRSTU$ is equilateral and is inscribed in the circle with center O .

Quantity A

The length of diameter $UO R$

Quantity B

The length of arc RST

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

You are given that hexagon $PQRSTU$ is equilateral, that is, the sides of the hexagon all have the same length. You are also given that the hexagon is inscribed in the circle. From this information you can conclude that the 6 vertices of the hexagon divide the circumference of the circle into 6 arcs of equal length. You are asked to compare Quantity A, which is the diameter of the circle, to Quantity B, which is the length of arc RST . Note that arc RST consists of 2 of the 6 arcs, namely arcs RS and ST .

In order to compare the two quantities, let r be the radius of the circle, so that Quantity A is equal to $2r$. Also, the circumference of the circle is $2\pi r$, so the length of each of the 6 arcs is $\frac{2\pi r}{6}$, or $\frac{\pi r}{3}$. Thus arcs RS and ST each have length $\frac{\pi r}{3}$, and therefore Quantity B, the length of arc RST , is $\frac{2\pi r}{3}$.

The comparison of $2r$ with $\frac{2\pi r}{3}$ can be simplified by factoring out $2r$ from each expression, resulting in the comparison of 1 with $\frac{\pi}{3}$. Since $\pi > 3$, it follows that $1 < \frac{\pi}{3}$, and so $2r < \frac{2\pi r}{3}$. Thus Quantity A is less than Quantity B, and the correct answer is **Choice 2**, that is, **Quantity B is greater**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-06

Quantity A

$$(r + s)^2$$

Quantity B

$$r^2 + s^2$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

In this question, you are asked to compare Quantity A, $(r + s)^2$, with Quantity B, $r^2 + s^2$. One way to approach this question is to set up a comparison between the two quantities using the placeholder symbol \square to represent the relationship between them, as follows.

$$(r + s)^2 \square r^2 + s^2$$

Then simplify the comparison as follows.

Step 1: Expand the left side of the comparison to get

$$r^2 + 2rs + s^2 \square r^2 + s^2$$

Step 2: Subtract $r^2 + s^2$ from both sides to get

$$2rs \square 0$$

All you know about r and s is that they represent real numbers. If they have the same sign, then $2rs > 0$; if they have different signs, then $2rs < 0$. Hence, there is not enough information to determine which is greater, $2rs$ or 0 . Adding $r^2 + s^2$ back to both sides yields the original quantities and yields the same conclusion about them. Thus the correct answer is **Choice 4**, that is, **The relationship cannot be determined from the information given**.

Q's-07

$$x > 2 \text{ and } y < 0$$

Quantity A

$$|xy| - x$$

Quantity B

$$xy$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Explanation

In this question, you are asked to compare Quantity A, $|xy| - x$, with Quantity B, xy , given that $x > 2$ and $y < 0$. One way to approach this question is to set up a comparison between the two quantities using the placeholder symbol \square to represent the relationship between them, as follows.

$$|xy| - x \square xy$$

Note that since x is positive and y is negative, it follows that xy is negative and therefore that $|xy| = -xy$. Thus you can rewrite the comparison as

$$-xy - x \square xy$$

You can further simplify the comparison as follows.

Step 1: Add xy to both sides to get

$$-x \square 2xy$$

Step 2: Divide both sides by the positive number x to get

$$-1 \square 2y$$

You can further simplify the comparison as follows.

Step 1: Add xy to both sides to get

$$-x \square 2xy$$

Step 2: Divide both sides by the positive number x to get

$$-1 \square 2y$$

The only information you are given about y is that it is less than 0. Note that if $-\frac{1}{2} < y < 0$, then $-1 < 2y$, but if $y < -\frac{1}{2}$, then $-1 > 2y$. Therefore the relationship between the simplified quantities -1 and $2y$ cannot be determined. Because the two simplification steps above are reversible, the same conclusion applies to Quantities A and B. Thus the correct answer is **Choice 4**, that is, **The relationship cannot be determined from the information given**.

This explanation uses the following strategies.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 13: Determine Whether a Conclusion Follows from the Information Given

Difficulty level: 5 (1 = easy, 5 = hard)

Q's-08

Ben has 30 pencils in a box. Each of the pencils is one of 5 different colors, and there are 6 pencils of each color. If Ben selects pencils one at a time from the box without being able to see the pencils, what is the minimum number of pencils that he must select in order to ensure that he selects at least 2 pencils of each color?

24

25

26

27

28

Explanation

Ben will select pencils one at a time from 30 pencils without being able to see them. From the 30 pencils, consisting of 6 pencils of each of 5 different colors, it would be possible to select all 6 pencils of only 4 of the colors, or 24 pencils, without selecting any pencils of the 5th color. At this point, he would not yet have at least 2 pencils of each color, and there would be 6 pencils remaining, all of the 5th color. The next 2 selections would guarantee that Ben has selected at least 2 pencils of each color, requiring a total of $24 + 2$, or 26, selections.

Although the scenario above seems like the case that requires the greatest number of selections, it is actually the scenario that has the minimum number of selections that would ensure at least 2 pencils of each color, based only on the number of selections that are all made without being able to see the pencils. The correct answer is **Choice 3**, that is, **26**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-09

The price of a package of notebooks is $\frac{1}{3}$ more at Store *A* than at Store *B*. If the difference in these prices is \$0.35, what is the price at Store *A*?

\$0.70

\$1.05

\$1.40

\$1.75

\$2.45

Explanation

Let x be the price, in dollars, of a package of notebooks at Store B . Then the price of a package of notebooks at Store A can be represented by $x + \frac{x}{3}$, or $\frac{4x}{3}$. Therefore, the difference between the two prices is $\frac{x}{3}$. Since you are given that the difference between the two prices is \$0.35, it follows that $\frac{x}{3} = \$0.35$, or $x = \$1.05$. Therefore, the price of a package of notebooks at Store A is $\left(\frac{4}{3}\right)(\$1.05)$, or \$1.40. The correct answer is **Choice 3**, that is, **\$1.40**.

This explanation uses the following strategy.

Strategy 1: Translate from words to an Arithmetic or Algebraic Representation

Difficulty level: 3 (1 = easy, 5 = hard)

Q's-10

The circumference of circle C is equal to the perimeter of square S . If the area of the circle is z , which of the following represents the area of the square, in terms of z ?

$\frac{\pi}{4z}$

$\frac{4}{z\pi}$

$\frac{z\pi}{4}$

$\frac{4\pi}{z}$

$\frac{4z}{\pi}$

Explanation

Let r be the radius of circle C . Then the circumference of C is $2\pi r$ and the area of C is πr^2 . You are given that the area of C is equal to z , so $\pi r^2 = z$. Let x be the length of one side of square S . You are given that the circumference of C equals the perimeter of S , so $2\pi r = 4x$. To answer the question, you need to represent the area of the square, which is x^2 , in terms of z .

Since the equation $\pi r^2 = z$ gives a relationship between z and r and the equation $2\pi r = 4x$ gives a relationship between x and r , you can solve both equations for r and use the results to determine the relationship between x and z and also the relationship between x^2 and z .

Solving the equation $\pi r^2 = z$ for r gives $r = \sqrt{\frac{z}{\pi}}$, and solving the equation $2\pi r = 4x$ for r gives $r = \frac{2x}{\pi}$. Since both $\sqrt{\frac{z}{\pi}}$ and $\frac{2x}{\pi}$ are equal to r , it follows that $\sqrt{\frac{z}{\pi}} = \frac{2x}{\pi}$. Squaring both sides of the equation $\sqrt{\frac{z}{\pi}} = \frac{2x}{\pi}$ gives the equation $\frac{z}{\pi} = \frac{4x^2}{\pi^2}$. Solving the last equation for x^2 gives $x^2 = \frac{z\pi}{4}$. Thus the correct answer is **Choice 3**, that is, $\frac{z\pi}{4}$.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-11

$$\frac{7}{3}, \frac{7}{4}, \frac{7}{5}, \dots$$

The first term of the infinite sequence shown is $\frac{7}{3}$, and each term thereafter has a numerator of 7 and a denominator that is 1 greater than the denominator of the preceding term. Which of the following terms of the sequence is equal to the 6th term of the sequence minus the 7th term of the sequence?

40th

42nd

44th

70th

72nd

Explanation

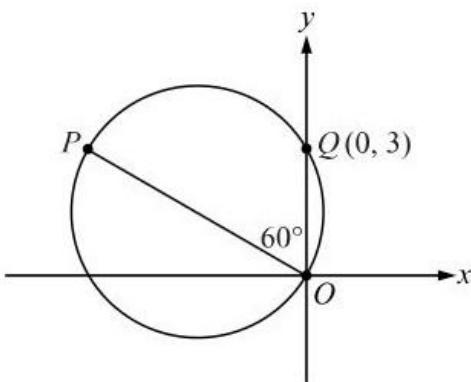
Examining the pattern of the terms, you can see that for each positive integer n , the n th term of the sequence has a 7 in the numerator and has a denominator that is 2 more than n . For example, the 10th term is $\frac{7}{12}$. Therefore, the 6th term of the sequence minus the 7th term of the sequence is $\frac{7}{8} - \frac{7}{9}$, or $\frac{7}{72}$. Based on the pattern, $\frac{7}{72}$ is the 70th term of the sequence. The correct answer is **Choice 4**, that is, **70th**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 7: Find a Pattern

Difficulty level: 3 (1 = easy, 5 = hard)

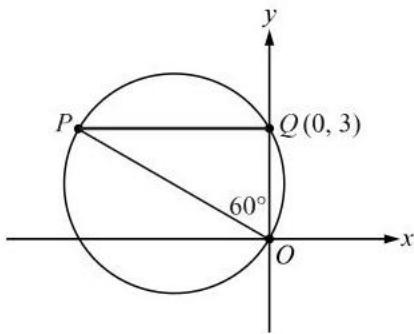
Q's-12

In the figure shown, OP is a diameter of the circle. What is the x -coordinate of point P ?

- 3
- 6
- $-\sqrt{3}$
- $-2\sqrt{3}$
- $-3\sqrt{3}$

Explanation

To answer this question, the first thing you may think of doing is adding line segment PQ to the figure in order to complete triangle PQO . The figure, with line segment PQ added, is shown below.



In the figure, angle PQO appears to be a right angle, and side PQ appears to be horizontal. You can conclude that angle PQO is indeed a right angle, because triangle PQO is inscribed in a circle and you are given that side PO is a diameter of the circle. Since side QO is vertical, it follows that side PQ is horizontal.

Since angle PQO is a right angle and the measure of angle POQ is 60° , it follows that triangle POQ is a 30° - 60° - 90° triangle. Recall that in a 30° - 60° - 90° triangle, the ratio of the length of the side opposite the 30° angle to the length of the side opposite the 60° angle is 1 to $\sqrt{3}$. In this case, that means that the ratio of the length of side OQ to the length of side PQ is 1 to $\sqrt{3}$.

Note that the length of side OQ is 3, so the length of side PQ is $3\sqrt{3}$. Since PQ is horizontal, with length $3\sqrt{3}$, and the x -coordinate of Q is 0, it follows that the x -coordinate of P is $-3\sqrt{3}$. The correct answer is **Choice 5**, that is, $-3\sqrt{3}$.

Q's-13

The odds in favor of the occurrence of event A are defined to be the ratio of the probability of A occurring to the probability of A not occurring. Past records indicate that the odds in favor of a shipment from Company Z arriving on the specified date are 3 to 7. On the basis of this record, what is the probability that a shipment from Company Z will not arrive on the specified date?

- $\frac{3}{10}$ $\frac{4}{10}$ $\frac{7}{10}$ $\frac{3}{7}$ $\frac{4}{7}$

Explanation

Let p be the probability that the shipment from Company Z arrives on the specified date. Then $1 - p$ is the probability that the shipment does not arrive on the date.

Recall that the odds of an event occurring are defined to be the ratio of the probability of the event occurring to the probability of the event not occurring. Since the odds of the shipment arriving on the specified date are 3 to 7, it follows that the ratio of p to $1 - p$ is 3 to 7, that is, $\frac{p}{1-p} = \frac{3}{7}$. You can solve the equation $\frac{p}{1-p} = \frac{3}{7}$ for p as follows.

$$\begin{aligned} 7p &= 3(1-p) \\ 7p &= 3 - 3p \\ 10p &= 3 \\ p &= \frac{3}{10} \end{aligned}$$

The probability that the shipment will not arrive on the specified date is therefore $1 - \frac{3}{10}$, or $\frac{7}{10}$. Thus the correct answer is **Choice 3**, that is, $\frac{7}{10}$.

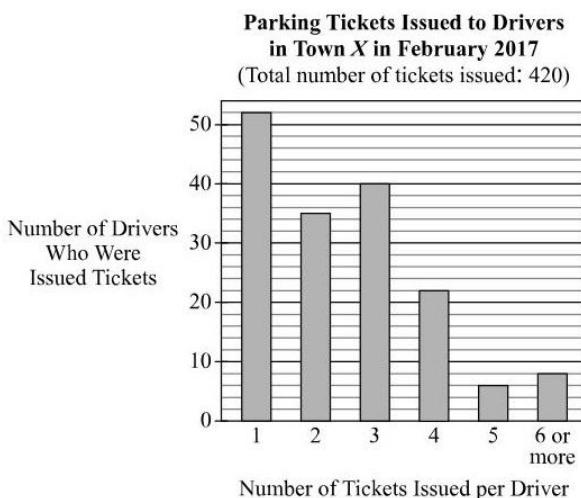
This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Q's-14

Questions 14–16 are based on the following data.



To the nearest whole percent, the number of drivers who were issued 3 parking tickets is what percent greater than the number who were issued 4 or more tickets?

- 4%
 9%
 10%
 11%
 16%

Explanation

The graph shows that the number of drivers who were issued 3 parking tickets is 40. The number of drivers who were issued 4 or more tickets is the sum of the numbers of drivers who were issued either 4 tickets, 5 tickets, or 6 or more tickets. From the graph, these numbers are 22, 6, and 8, respectively, so the sum is $22 + 6 + 8$, or 36.

Using the two numbers of drivers, 40 and 36, the question asks: To the nearest whole percent, 40 is what percent greater than 36? The answer is given by $\left(\frac{40 - 36}{36}\right)(100\%)$, or approximately 11.1%. The nearest whole percent to the answer is 11%, so the correct answer is **Choice 4**, that is, **11%**.

This explanation uses the following strategies.

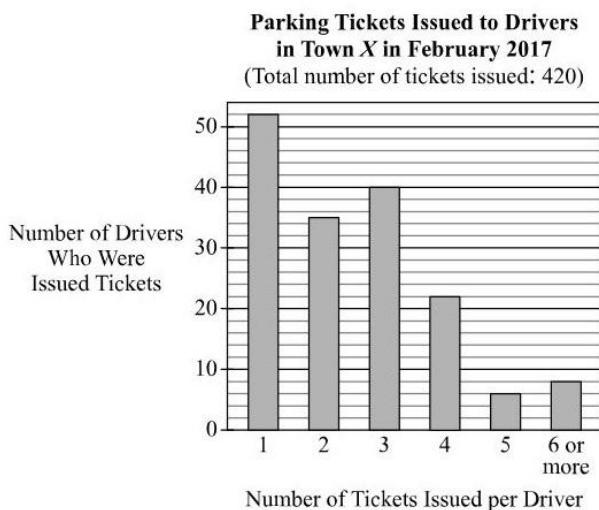
Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-15

Questions 14–16 are based on the following data.



What is the average (arithmetic mean) number of parking tickets issued to the drivers who were issued 6 or more tickets?

- 7.0
- 7.5
- 8.0
- 8.5
- 9.0

Explanation

You are asked to find the average number of parking tickets issued to the drivers who were issued 6 or more tickets, that is, to the drivers in the last, or sixth, category of the data. To find the average, you need to divide the total number of tickets issued to these drivers by the total number of these drivers. The graph shows that the number of drivers in the sixth category is 8.

To find the total number of tickets issued to the drivers who were issued 6 or more tickets requires some analysis of the data. Beginning with the first category, the graph shows that 52 drivers were each issued 1 ticket, for a total of 52 tickets; 35 drivers were each issued 2 tickets, for a total of 70 tickets; 40 drivers were each issued 3 tickets, for a total of 120 tickets; 22 drivers were each issued 4 tickets, for a total of 88 tickets; and 6 drivers were each issued 5 tickets, for a total of 30 tickets. However, because the sixth category is 6 or more tickets, the total number of tickets issued to the 8 drivers in that category cannot be directly determined.

In a search for more information, you may see under the title of the graph that the total number of tickets issued to the drivers in all six categories is 420. The numbers of tickets issued in the first five categories were found above, and their sum is $52 + 70 + 120 + 88 + 30$, or 360. Therefore the number of tickets issued in the sixth category must be $420 - 360$, or 60. Thus the average number of parking tickets issued to the drivers who were issued 6 or more tickets is $\frac{60}{8}$, or 7.5.

The correct answer is **Choice 2**, that is, **7.5**.

This explanation uses the following strategies.

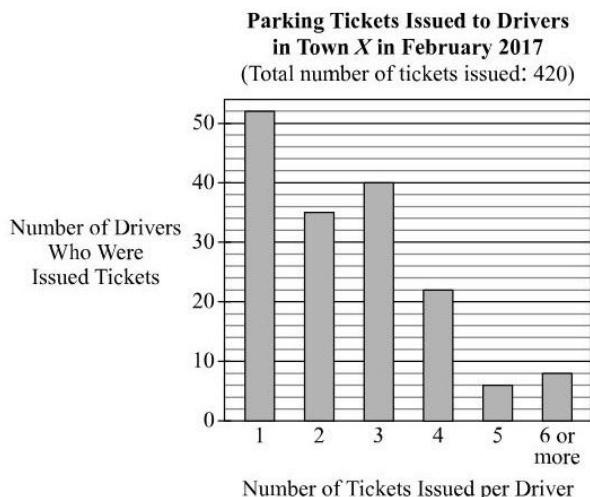
Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 14: Determine What Additional Information is Sufficient to Solve a Problem

Difficulty level: 4 (1 = easy, 5 = hard)

Q's-16

Questions 14–16 are based on the following data.



For the drivers who were issued parking tickets, what is the median number of tickets issued per driver?

- 2.0
- 2.5
- 3.0
- 3.5
- 4.0

Explanation

To understand the “median number of tickets issued per driver,” note that there are many drivers represented in the data, and each driver was issued a number of tickets. However, many drivers were issued the same number of tickets, so there are a lot of repetitions. To find the median of all the numbers of tickets—one number per driver—consider all the numbers, including repetitions, listed in order from least to greatest.

The list begins with 52 instances of 1, followed by 35 instances of 2, followed by 40 instances of 3, followed by 22 instances of 4, followed by 6 instances of 5, followed by 8 instances of numbers that are 6 or more. The list contains a total of $52 + 35 + 40 + 22 + 6 + 8$, or 163, numbers, which represents a total of 163 drivers.

Since the list has 163 numbers, which is an odd number, the median is the middle number in the list, which is the 82nd number. After 52 instances of 1, there are 35 instances of 2, so the 53rd number to the 87th number are all instances of 2, including the 82nd number. Therefore the median number of tickets issued per driver is 2, and the correct answer is **Choice 1**, that is, 2.0.

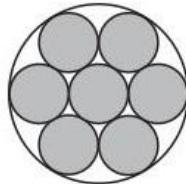
This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 5 (1 = easy, 5 = hard)

Q's-17

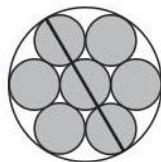


In the figure shown, seven small circles of equal diameter are located inside a large circle. Each of the six outer small circles is tangent to the small circle in the center, to two other adjacent small circles, and to the large circle. If the diameter of the large circle is D , then the sum of the areas of the unshaded regions inside the large circle is equal to which of the following?

- $\frac{\pi D^2}{36}$
- $\frac{\pi D^2}{18}$
- $\frac{\pi D^2}{9}$
- $\frac{\pi D^2}{2}$
- $\frac{7\pi D^2}{4}$

Explanation

From the figure and its description, it is clear that the six outer circles are equally spaced inside the large circle. Therefore, if a diameter of the large circle is drawn such that it passes through the center of one of the outer small circles, as shown below, then the diameter will also pass through the center of the small circle in the center and through the center of another outer small circle. It follows that the diameter of the large circle is composed of 3 diameters of the small circles, and so the diameter of each small circle is $\frac{D}{3}$.



The area of the large circle is $\pi\left(\frac{D}{2}\right)^2$, and the area of each small circle is $\pi\left(\frac{D}{6}\right)^2$. Since there are 7 small circles, it follows that the sum of the areas of the small circles is $7\pi\left(\frac{D}{6}\right)^2$ and the sum of the areas of the unshaded regions inside the large circle is $\pi\left(\frac{D}{2}\right)^2 - 7\pi\left(\frac{D}{6}\right)^2$, or $\frac{\pi D^2}{18}$. Thus the correct answer is **Choice 2**, that is, $\frac{\pi D^2}{18}$.

Q's-18

Of the students enrolled at University U in the fall of 2008, $\frac{3}{8}$ were sophomores and $\frac{1}{50}$ were biology majors. Which of the following could be the number of students enrolled at University U in the fall of 2008?

Indicate all such numbers.

7,000

7,040

7,050

7,100

7,125

7,200

Explanation

Let S be the number of enrolled students. From the information given, the number of sophomores was $\frac{3}{8}S$ and the number of biology majors was $\frac{1}{50}S$. So $\frac{3}{8}S$ and $\frac{1}{50}S$ must be whole numbers. From this you can conclude that the number of enrolled students must be a whole number that is divisible by 8 and by 50.

Considering the six choices, you can eliminate 7,040 and 7,125, which are clearly not divisible by 50. It is clear that each of the remaining four choices is divisible by 50, so you need only to check them for divisibility by 8. Both 7,050 and 7,100 are not divisible by 8, but 7,000 and 7,200 are. Thus the number of enrolled students could be 7,000 or 7,200. The correct answer consists of **Choices 1 and 6**, that is, **7,000 and 7,200**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: **5** (1 = easy, 5 = hard)

Q's-19

If $3x + y = 2$, $3x + 2y = 0$, and $x - 2z = 1$, what is the value of z ?

Give your answer as a fraction.

$$z = \frac{1}{6}$$

Explanation

Note that the first two equations, $3x + y = 2$ and $3x + 2y = 0$, contain the variables x and y , and the third equation, $x - 2z = 1$, contains the variables x and z . To find the value of z , you can solve the first two equations for x and then substitute the value of x in the third equation to solve for z .

To solve the equations $3x + y = 2$ and $3x + 2y = 0$ for x , eliminate y as follows. Multiply $3x + y = 2$ by 2, which gives you $6x + 2y = 4$. Then subtract $3x + 2y = 0$ from $6x + 2y = 4$ to get $3x = 4$, or $x = \frac{4}{3}$.

Substituting $\frac{4}{3}$ for x in the equation $x - 2z = 1$ gives $\frac{4}{3} - 2z = 1$, which can be solved for z as follows.

$$\begin{aligned}\frac{4}{3} - 2z &= 1 \\ -2z &= -\frac{1}{3} \\ z &= \frac{1}{6}\end{aligned}$$

Thus the correct answer is $\frac{1}{6}$.

This explanation uses the following strategy.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 5 (1 = easy, 5 = hard)

Q's-20

When the positive integer N is divided by 16, the remainder is 3. Which of the following integers could be the remainder when N is divided by 6?

Indicate all such integers.

0

1

2

3

4

5

Explanation

| k | N | Remainder When N Is Divided by 6 |
|-----|-----|------------------------------------|
| 1 | 19 | 1 |
| 2 | 35 | 5 |
| 3 | 51 | 3 |
| 4 | 67 | 1 |
| 5 | 83 | 5 |
| 6 | 99 | 3 |
| 7 | 115 | 1 |
| 8 | 131 | 5 |

Note that the remainders include 1, 5, and 3, which repeat in that order as k increases. The pattern in the table suggests that 1, 3, and 5 are the only remainders when N is divided by 6, but it does not show that 0, 2, and 4 cannot be the remainder.

Note that if 0 were the remainder when N is divided by 6, then N would be divisible by 6, and so N would be an even integer. However, you know that $N = 16k + 3$ for some integer k , which shows that N must be an odd integer. That contradiction shows that 0 cannot be the remainder. The same argument can be made for the possible remainders 2 and 4, namely that N would have to be an even integer to have a remainder of 2 or 4 when N is divided by 6, but N would have to be an odd integer to satisfy $N = 16k + 3$, yielding a contradiction.

Thus the correct answer consists of **Choices 2, 4, and 6**, that is, **1, 3, and 5**.

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