Answer Explanation ×

Answer 1

Apply

1A. Apply

An attendee of the conference sponsored by CC would pay, for registration and a room in the conference block, $620 + 2($110) = $840.

By employing the ROB strategy, an attendee would pay $720 + 2($70) = $860.

Therefore the attendee would not save money by employing the ROB strategy.

The correct answer is *No*.

1B. Apply

An attendee of the conference sponsored by FFNA would pay, for registration and a room in the conference block, $275 + 2($140) = $555.

By employing the ROB strategy, an attendee would pay $325 + 2($70) = $465.

Therefore the attendee would save money by employing the ROB strategy.

The correct answer is *Yes*.

1C. Apply

An attendee of the conference sponsored by HMHPA would pay, for registration and a room in the conference block, $575 + 2($104) = $783.

By employing the ROB strategy, an attendee would pay $600 + 2($79) = $758.

Therefore the attendee would save money by employing the ROB strategy.

The correct answer is *Yes*.

Answer 2

Apply

For a hotel to lose room revenue in this scenario, the lowest rate must be less than 75% of the block rate. This will occur when the ratio of the lowest rate to the block rate is less than 0.75.

2A. Apply

For the conferences hosted by the Asiawest Center, the ratios are $\frac{185}{190} \approx 0.97$ for the conference sponsored by CDA and $\frac{185}{195} \approx 0.95$ for the conferences sponsored by QRTA and RCD. Therefore the Asiawest Center would not lose room revenue.

The correct answer is *No*.

2B. Apply

For the one conference hosted by Bard Inn—sponsored by PNDA—the ratio is $\frac{125}{125} = 1$; thus the Bard Inn would not lose room revenue.

The correct answer is *No*.

2C. Apply

For the conference sponsored by CC, for example, the ratio is $\frac{70}{110} \approx 0.64$, which indicates that the host hotel, Hilton, would lose room revenue. Note that Hilton will also lose revenue with its other two sponsors.

The correct answer is *Yes*.

Answer 3

Strategize

3. For an attendee employing the ROB strategy, the savings on room fees is $\$X - \$Y$ per night. Over two nights, then, the attendee would save $2(\$X - \$Y)$. According to the study cited in the article, a registration discount equal to half of the savings of an attendee's cost-saving strategy would be sufficient to defer the use of that strategy. Therefore the registration discount should be set at $\frac{2(X-Y)}{2} = X - Y$.

The correct answer is *C*.

Answer 4

Apply

4A. Apply

For the conference sponsored by CC, an attendee applying the ROHH strategy would save 2($110 – $65) = $90 in room charges and pay an additional $720 – $620 = $100 on the registration fee. Therefore the attendee would spend an additional $10 by employing the ROHH strategy.

The correct answer is *No*.

4B. Apply

For the conference sponsored by FFNA, an attendee applying the ROHH strategy would save 2($140 – $65) = $150 in room charges and pay an additional $325 – $275 = $50 on the registration fee. Therefore the attendee would spend $100 less by employing the ROHH strategy.

The correct answer is *Yes*.

4C. Apply

For the conference sponsored by PPOA, an attendee applying the ROHH strategy would save 2($105 – $65) = $80 in room charges and pay an additional $550 – $400 = $150 on the registration fee. Therefore the attendee would spend an additional $70 by employing the ROHH strategy.

The correct answer is *No*.

Answer 5

Apply

5A. Apply

It is more likely that the speaker's compensation is a fixed cost for the sponsor of the conference. There is nothing in the information provided to suggest that the speaker would earn less as a result of attendees using ROHH strategies.

The correct answer is *No loss*.

5B. Apply

If attendees are employing ROHH strategies, then necessarily they would not be staying in the conference hotel. If this contributes to vacancies in the host hotel as is suggested, then it is likely that fewer people would be ordering room service. Therefore it is likely that a room service waiter at the host hotel would earn less.

The correct answer is *Loss*.

5C. Apply

Salaries are usually fixed amounts, thus the front desk manager's salary most likely represents a fixed cost for the host hotel. There is nothing in the information provided to suggest that the front desk manager would earn less.

The correct answer is *No loss.*

Answer 6

Evaluate

6. The conference sponsored by AMG is the only conference in which the cost of employing the ROHH strategy ($65 per night) is equal to the cost of employing the ROB strategy ($65 per night). According to the article, attendees prefer to stay in the host hotel. Therefore the ROB strategy would likely be favored over the ROHH strategy.

For each of the other conferences, however, there is a substantial cost-saving advantage in employing the ROHH strategy rather than the ROB strategy—CDA, $185 – $65 = $120; QRTA, $185 – $65 = $120; RCD, $185 – $65 = $120; and WWLOP, $155 – $65 = $90. For these conferences, it is much less likely that attendees will prefer the ROB strategy.

The correct answer is *A.*

Answer 7

Infer

7A. Infer

Board prestige is one of the four variables examined by the researchers for any correlation they may have with IPO pricing. The discussion of underpriced IPOs does not involve these variables, and while board prestige is found by the researchers to be negatively correlated with IPO price, it cannot therefore be inferred that a lower IPO price has any correlation with an IPO being underpriced.

The correct answer is *Not inferable.*

7B. Infer

Underpricing is defined by the passage as setting an IPO price that is lower than what that price ends up being at the end of that first day of trading, and lines 25–28 of the passage make it clear that firms should avoid underpricing their IPOs. Looking at the table of Kenyan IPOs, however, Firestone East Africa is the only firm listed whose IPO price was higher than its first day closing price; its IPO was therefore, by definition, not underpriced.

The correct answer is *Not inferable.*

7C. Infer

As noted in the discussion of 7B, there is one firm listed in the table of Kenyan IPOs, Firestone East Africa, whose IPO price was higher than its first day closing price and whose IPO price was therefore not underpriced. Mumias Sugar had 0.00% underpricing, so there are two firms that, by definition, did not have an underpriced IPO.

The correct answer is *Inferable.*

Answer 8

Infer

8A. Infer

The passage indicates that the researchers found a strong negative correlation between board prestige and IPO price (lines 14–19). In other words, the lower the IPO price of a firm, the more prestigious that firm's board is likely to be. Looking at the table of Kenyan IPOs for 2008, Safaricom had an IPO price of 5.00 Kenyan shillings and Co-Operative Bank had an IPO price of 9.50 shillings, suggesting that Safaricom's board was more prestigious than Co-Operative Bank's.

The correct answer is *Supported.*

8B. Infer

While Kenya Re and Eveready had identical IPO prices (9.50 Kenyan shillings), the passage indicates that the researchers found that of the four variables they examined, neither firm size nor firm age had any correlation with IPO price. Therefore, no conclusions about a firm's size can be properly drawn from that firm's IPO price.

The correct answer is *Not supported.*

8C. Infer

The passage indicates that the researchers found a strong negative correlation between investor sentiment and IPO price (lines 14–19). In other words, the higher the IPO price of a firm, the lower investor sentiment toward that firm is likely to be. Looking at the table of Kenyan IPOs for 2006, Kengen had an IPO price of 11.90 Kenyan shillings, whereas Scangroup (10.45) and Eveready (9.50) had lower IPO prices, suggesting that investor sentiment was likely less favorable toward Kengen than toward either Scangroup or Eveready.

The correct answer is *Not supported.*

Answer 9

Evaluate

9. The passage indicates that board prestige is one of the four variables examined by the researchers for any correlation they may have with IPO pricing and also that it was one of the two variables about which the findings surprised the researchers. Only one of the choices fully captures the reason board prestige is mentioned, C. Board prestige is not tied to investor sentiment in any causal way, eliminating both A and D. The author of the passage makes no recommendations about the variables examined by the researchers, eliminating B. While board prestige is negatively correlated with IPO price, it is not used in the passage as evidence that some variables are often negatively correlated with IPO price, eliminating E.

The correct answer is *C.*

Answer 10

Infer

10A. Infer

The sports association spokesperson asserts that "conditions must be placed on [the] practices" of "posting video clips, audio clips, digital photographs, and live score updates . . . on [news organizations'] websites" (lines 11–15). It is strongly suggested that the sports association would disagree with the assertion that there should be no restrictions.

The correct answer is *Otherwise.*

10B. Infer

The news organizations spokesperson states that "online news sites are not asking to broadcast sporting events in their entirety" (lines 10–11), which suggests that such organizations do not believe that doing so would be necessary for adequate reporting. This indicates that they would likely accept the statement.

The sports association spokesperson indicates that the association provides several amenities for reporters such as media passes so that they can "effectively report" (line 9) on the association's events. This indicates that they believe the events can be reported adequately without broadcasting the entire event.

The correct answer is *Both accept.*

10C. Infer

The sports association spokesperson claims that some activities such as "posting video clips, audio clips, digital photographs, and live score updates" (lines 11–13) harm the value of the broadcasting contracts. It is likely that the sports association would not consider this a benefit; therefore it is unlikely that the sports association would accept this statement.

The correct answer is *Otherwise*.

Answer 11

Infer

11A. Infer

Although the news organizations spokesperson says that "free, engaging sports reporting generates interest in sports" (lines 14–15), this statement only implies an increase in interest. The statement does not specify the extent of this increase.

The sports association spokesperson does not express an opinion on whether online reporting generates interest in the association's events.

The correct answer is *Cannot infer disagreement.*

11B. Infer

Among the practices specifically mentioned by the sports association spokesperson is the practice of live score updates. In suggesting that "conditions must be placed" (line 14) on this practice, the spokesperson implies that the frequency of score updates should not be unlimited.

The news organizations spokesperson states that the "news organizations must be allowed to report freely about sports on their websites, in any timeframe, using any type of online medium they deem effective" (lines 16–20), indicating that the organizations believe that no such limitations should be placed.

The correct answer is *Disagree.*

11C. Infer

The sports association spokesperson insists that "conditions must be placed on these practices" (lines 14–15) of a website updating scores from a sporting event. The news organizations spokesperson implies that they "must be allowed to report freely about sports on their websites . . . using any type of online medium they deem effective" (lines 17–20). From these two statements it can be inferred that the two groups disagree about the conditions under which a news organization should be allowed access to report on the sports association's events.

The correct answer is *Disagree.*

Answer 12

Infer

12. The news organizations spokesperson asserts that news organizations "must be allowed to report freely about sports on their websites . . . using any type of online medium they deem effective" (lines 17–20). From this it can be inferred that the news organizations believe that the restrictions proposed by the sports association spokesperson would hamper their efforts to cover sports news.

The correct answer is *B.*

Answer 13

Infer

13A. Infer

Neither *Height-for-age standards* nor *Weight-for-height standards* provide a distribution of height on the basis of weight, so it is impossible to determine the proportion of boys weighing 19 kg whose height is less than 110 cm.

The correct answer is *No.*

13B. Infer

Using the table in *Height-for-age standards*, the 85th percentile in height for boys aged 4 years 3 months is 109.5 cm, so 100% – 85%, or 15%, of boys aged 4 years 3 months are taller than 109.5 cm. Thus, at most, 15% of boys of this age are taller than B's height of 110 cm.

The correct answer is *Yes.*

13C. Infer

Using the table in *Height-for-age standards*, the 50th percentile in height for boys aged 5 years 0 months is 110.0 cm, which is the same height as B. Therefore, B's height is greater than or equal to that of 100% – 50%, or 50%, of boys aged 5 years 0 months.

The correct answer is *Yes.*

Answer 14

Infer

14A. Infer

Using the table in *Height-for-age standards*, the 50th percentile height for boys aged 3 years 3 months is 98.0 cm, so 50% of boys this age are taller than this. For boys aged 3 years 6 months and older, the 50th percentile height is greater than 98.0 cm, so at least 50% of boys this age are taller than this. Moreover, for boys 4 years 0 months and older, the 15th percentile height exceeds 98.0 cm, so at these ages, at least 85% of boys are taller than 98.0 cm. Thus for a boy selected at random from a model population whose age is greater than 3 years 3 months, the probability that his height is at least 98.0 cm is greater than 50%.

The correct answer is *Yes*.

14B. Infer

Using *Weight-for-height standards*, the 3rd percentile weight for height 105 cm is just over 14 kg, and for heights greater than 105 cm, the 3rd percentile weight is greater than 14 kg. Thus, at most, 3% of the population of boys at least 105 cm tall has a weight of 14.0 kg or less. In particular, at most, 3% of the population of boys at least 105 cm tall has a weight of exactly 14.0 kg.

The correct answer is *Yes*.

14C. Infer

Using *Height-for-age standards*, the 85th percentile in height for boys aged 5 years 0 months is 114.8 cm. This means that a boy 114.8 cm tall is as tall or taller than 85% of boys aged 5 years 0 months. It does not follow that a boy 114.8 cm tall is necessarily *taller* than 85% of boys aged 5 years 0 months, so it is not necessarily true of a boy 114 cm tall, either.

The correct answer is *No*.

Answer 15

Infer

15. Neither *Height-for-age standards* nor *Weight-for-height standards* provide a distribution of age on the basis of weight, height, or any other variable, so it is impossible to determine where the boy's age falls in the distribution of age for height (choice A). The boy's weight is less than that of 50% of boys his height, and his height is less than that of 50% of boys his age, but it is impossible to tell where his weight falls among the weights of boys his age (choice B). Likewise, knowing height-for-weight percentiles does not provide information about weight-for-height percentiles (choice C).

What can be approximated, however, is his height at each age and his weight at each height; thus it is possible to know his weight at each age. *Height-for-age standards* indicates that at age 2 years 0 months, the boy was 87.1 cm tall, and at age 5 years 0 months, he was 110.0 cm tall. *Weight-for-height standards* indicates that the 50th percentile weight for boys 87.1 cm tall is approximately 12 kg, while the 50th percentile weight for boys 110.0 cm tall is approximately 18 kg. Thus his weight at age 5 years 0 months is approximately $\frac{18}{12}(100)\%$, or 150%, of his weight at age 2 years 0 months.

The correct answer is *D*.

Answer 16

Infer; Apply

16A. Infer

According to the graph in *Weight-for-height standards*, the 15th percentile in weight for a boy of height 110 cm is approximately 17 kg. Therefore, 17 kg is greater than or equal to the weight of 15% of boys of that height. But 17 kg is less than B's weight of 19 kg, so the percentage of boys whose weight is less than or equal to B's weight may be somewhat larger than 15%. Consequently, at least 15% of boys at B's height have a weight that is less than or equal to that of B.

The correct answer is *Yes.*

16B. Apply

B's height is 110 cm, and 10% of 110 is equal to 11, so a boy is within 10% of B's height provided that he is between 99 cm and 121 cm tall. According to *Height-for-age standards*, for boys aged 4 years 3 months, 100.5 cm is the 15th percentile in height and 113.1 cm is the 97th percentile in height. Therefore, 97% – 15%, or 82% of boys B's age have heights between 100.5 cm and 113.1 cm. Since 99 < 100.5 and 113.1 < 121, the heights of all these boys are within 10% of B's height, so at least 82%—and hence at least 80%—of boys B's age have heights within 10% of B's height.

The correct answer is *Yes.*

16C. Apply

According to *Height-for-age standards*, for boys aged 4 years 0 months, the 97th percentile in height is 111.2 cm, so B's height of 110 cm is less than that of at *least* 3% of boys this age. If B's height were also less than that of at *most* 3% of boys this age, then 110 cm would have to be the 97th percentile in height for boys aged 4 years 0 months, which it is not.

The correct answer is *No.*

Answer 17

Infer

17A. Infer

Using *Height-for-age standards* for boys aged 4 years 0 months, the 15th percentile in height is 99.0 cm. Thus 15% of boys of this age are 99.0 cm tall or shorter. Note that the 3rd percentile in height for boys of this age is 95.4 cm, so 3% of boys of this age are at this height or shorter. Therefore, 15% – 3%, or 12% of boys aged 4 years 0 months have heights greater than 95.4 cm and less than or equal to 99.0 cm. The proportion of boys of this age whose height is exactly 99.0 cm must therefore be less than or equal to 12%, so the indicated probability is also less than or equal to 12%.

The correct answer is *No.*

17B. Infer

Using *Height-for-age standards*, the 3rd percentile in height for ages from 2 years 0 months through 5 years 0 months is at least 81.4 cm. This means that a boy from a model population whose height is 81.4 cm is shorter than at least 97% of boys his age. Thus a boy who is 81 cm tall is shorter than at least 97% of boys his age and thus shorter than at least 95% of boys his age.

The correct answer is *Yes.*

17C. Infer

Weight-for-height standards provide a weight distribution for boys 120 cm tall; in particular, 97% of boys at this height weigh more than 18 kg. But a randomly selected boy at this height could conceivably weigh much less than 18 kg. Moreover, even if the boy's weight were known, a percentile distribution of weight for boys aged 2 years 6 months is lacking, so it is impossible to answer the question based on the information provided.

The correct answer is *No.*

Answer 18

Infer

18. Neither *Height-for-age standards* nor *Weight-for-height standards* provide a distribution of age on the basis of weight, height, or any other variable, so it is impossible to determine where the boy's age falls in the distribution of age for height (choice A). The boy's weight is less than that of 97% of boys his height, and his height is less than that of 97% of boys his age, but it is impossible to tell where his weight falls among the weights of boys his age (choice B). Likewise, knowing height-for-weight percentiles does not provide information about weight-for-height percentiles (choice C).

However, it is possible to approximate his height at each age and his weight at each height; thus it is possible to determine his weight at each age. *Height-for-age standards* indicates that at age 2 years 0 months, the boy was 92.9 cm tall, and at age 5 years 0 months, he was 118.7 cm tall. *Weight-for-height standards* indicates that the 97th percentile weight for boys 92.9 cm tall is approximately 16 kg, while the 97th percentile weight for boys 118.7 cm tall is between 26 kg and 27 kg. Thus his weight at age 5 years 0 months is roughly between $\frac{26}{16}(100)\% = 162.5\%$ and $\frac{27}{16}(100)\% = 168.75\%$, or approximately 166%, of his weight at age 2 years 0 months.

The correct answer is *D.*

Answer 19

Infer; Recognize

19A. Infer

Sorting on *Continent* reveals that, when temperatures are measured in °C, the mean maximum temperature for the 3 cities listed in South America was $\frac{1}{3}(29 + 38 + 29)$, or 32, while the mean maximum temperature for the 2 cities listed in Oceania was $\frac{1}{2}(25 + 29)$, or 27. Since 32 > 27, the mean maximum temperature for the cities in South America was greater than that for the cities in Oceania.

The correct answer is *Yes.*

19B. Recognize

Sorting on *Weather conditions* reveals 7 cities reporting *fine* weather, for which the least maximum temperature reported was 5°C. Thus none of the 7 cities reported a maximum temperature less than 0°C.

The correct answer is *No.*

19C. Infer

Sorting on *Continent* (as in 19A) reveals that there are 8 Asian cities listed. When the minimum temperatures for the 8 cities are ordered from least to greatest, the median minimum temperature is equal to the arithmetic mean of the fourth and fifth temperatures in the list. Using the *Continent* sort, the first five temperatures in the list (in °C) are –3, –3, 3, 3, and 21, so the median minimum temperature is therefore $\frac{1}{2}(3 + 21)$, or 12.

The correct answer is *Yes.*

Answer 20

Infer

20A. Infer

Let E_1, E_2, F, and S denote a student's Exam 1 score, Exam 2 score, final exam score, and final score, respectively. If F and E_2 are equally weighted in computing the final score, then there must be constants x and y such that $y + x + x = 1$ and for each student, $S = yE_1 + xE_2 + xF$. Since $y = 1 - 2x$, it follows that $S = (1 - 2x)E_1 + xE_2 + xF$. Solving this last equation for x in terms of E_1, E_2, F, and S, $x = \frac{S - E_1}{E_2 + F - 2E_1}$. In particular, it follows that this fractional expression must be constant.

For Abusuba—the first student listed in the table—$E_1 = 89$, $E_2 = 87$, $F = 85$, and $S = 86.50$, so $\frac{S - E_1}{E_2 + F - 2E_1} = \frac{86.50 - 89}{87 + 85 - 2(89)}$, which is equal to $\frac{5}{12}$. For Ardanin—the second student listed in the table—$E_1 = 85$, $E_2 = 83$, $F = 84$, and $S = 84.00$, so $\frac{S - E_1}{E_2 + F - 2E_1} = \frac{84.00 - 85}{83 + 84 - 2(85)}$, which is equal to $\frac{1}{3}$. Since $\frac{5}{12} \neq \frac{1}{3}$, the fractional expression is not constant. Therefore F and E_2 are not

The correct answer is *No.*

20B. Infer

There are 25 students in the class, so when the table is sorted on *Final score*, the median final score is equal to the score in the 13th position (from either top or bottom) in the table. This is the score of the student whose surname is Orlando, and it is equal to 81.50.

The correct answer is *Yes.*

20C. Infer

Sorting on *Year in program* reveals that there are 6 students in year 3—Derezinski, Lindt, Nguyen, Radzinsky, Sykes, and Vladimirov—with Exam 1 scores of 85, 87, 70, 91, 51, and 69, respectively. The lowest of these scores is 51 (Sykes) and the highest is 91 (Radzinsky), so the range of the scores is 91 – 51, or 40.

The correct answer is *Yes.*

Answer 21

Recognize; Infer

21A. Recognize

Sorting the table on *Mean MI* reveals that the four populations with the lowest market integration (Hadza, Au, Tsimane, and Yasawa) are exactly the four populations that forage.

The correct answer is *Yes.*

21B. Recognize

Sorting the table on *Mean CS* reveals that the three populations that depend on both farming and wage work (Isanga Village, Maragoli, and Gusii) rank 5th, 2nd, and 1st in the group in terms of mean community size.

The correct answer is *Yes.*

21C. Infer

To determine the range for market integration, sort the table on *Mean MI*. The maximum market integration is 82 (by the Sanquianga) and the minimum market integration is 0 (by the Hadza). Therefore the range for market integration is 82 – 0 = 82.

To determine the range for participation in world religions, examine the table sort for *Mean WR*. The maximum participation in world religions is 100 (by several populations) and the minimum participation in world religions is 0 (by the Hadza). Therefore the range for participation in world religions is 100 – 0 = 100.

The range for market integration is less than the range for participation in world religions.

The correct answer is *Yes.*

Answer 22

Infer; Recognize

22A. Infer

Sorting the table on *Cooked (yes/no)* reveals that there are 5 uncooked vegetables listed, 4 of which provide 1 g of protein and 1 of which provides 3 g of protein; furthermore, there are 10 cooked vegetables, 3 of which provide 2 g, 3 of which provide 3 g, and 4 of which provide 5 g of protein. When the numbers of grams of protein provided by the 5 uncooked vegetables are listed in order from least to greatest—1, 1, 1, 1, 3—the median number of grams of protein is given by the 3rd value in the list, 1. When the numbers of grams of protein provided by the 10 cooked vegetables are listed in order from least to greatest—2, 2, 2, 3, 3, 3, 5, 5, 5, 5—the median number of grams of protein is given by the arithmetic mean of the 5th and 6th values in the list, $\frac{1}{2}(3 + 3)$, or 3. Therefore the median amount of protein provided by the uncooked vegetables, 1 g, is equal to $\frac{1}{3}(3\text{ g})$, or $\frac{1}{3}$ the median amount of protein provided by the cooked vegetables.

The correct answer is *Yes*.

22B. Infer

Sorting on *Carbohydrate (g)* reveals that cooked corn provides the largest amount of carbohydrate of the vegetables listed, at 32 g. The median amount of carbohydrate for the other 14 vegetables listed is given by taking the arithmetic mean of the 7th and 8th values listed—that is, the arithmetic mean of the values for cooked asparagus and cooked broccoli, $\frac{1}{2}(8 + 8)$ g, or 8 g. Since 32 = 4(8), the amount of carbohydrate per serving of cooked corn is exactly 4—not 3—times the median for the other 14 vegetable options listed.

The correct answer is *No*.

22C. Recognize

When the table is sorted on *Total fiber (g)*, the first 8 vegetables listed are those having total fiber less than 3.0 g. Among these 8, uncooked sweet green pepper has the greatest amount of carbohydrate per serving, at 10 g. Hence, none of these 8 vegetables has more than 10 g of carbohydrate per serving.

The correct answer is *Yes*.

Answer 23

Recognize; Infer

23A. Recognize

Sorting on *Country* brings the 9 United States universities to the bottom of the table. Starting from the top of this list and working downward, the employer score is greater than the total score for both Harvard University (78.0 employer, 77.5 total) and UCLA (51.3 employer, 51.1 total).

The correct answer is *No.*

23B. Recognize

Sorting on *Employer score* reveals that there are 6 universities—from UCLA through University of Cambridge in order from least to greatest—for which the employer score is greater than 50. Among these, only Harvard University has a citations score (53.8) that is also greater than 50.

The correct answer is *Yes.*

23C. Infer

University of Tokyo's academic score is 79.7 and total score is 53.6, so the magnitude of the difference between these values is 79.7 – 53.6, or 26.1. By scanning the original table—already sorted on *Total score*—from top to bottom, it is relatively straightforward to eliminate all other universities for which the magnitude of the difference is less than 20. This process of elimination leaves only 3 other universities to check: MIT (97.4 academic, 72.8 total: difference 24.6), UCB (90.8 academic, 68.7 total: difference 22.1), Caltech (81.5 academic, 60.7 total: difference 20.8). Since 26.1 is greater than 24.6, 22.1, and 20.8, University of Tokyo is the school for which the magnitude of the difference is greatest.

The correct answer is *Yes.*

Answer 24

Infer; Apply; Recognize

24A. Infer

Sorting on *Depth (km)* produces a list of earthquakes in increasing order of depth. The median depth (in km) of the 22 earthquakes is the arithmetic mean of the 11th and 12th earthquakes appearing in the list, that is, $\frac{1}{2}(25 + 26) = 25.5$. The arithmetic mean of the depths is $\frac{1}{22}$ times the sum of all 22 depths; therefore, it must be greater than $\frac{1}{22}$ times the greatest depth listed. But this last value—that is, $\frac{1}{22}(641)$ km, or $29\frac{3}{22}$ km—is already greater than the median depth, so the arithmetic mean of the depths must be greater than the median of the depths.

The correct answer is *Yes*.

24B. Apply

A given location is north of the equator provided that its latitude is positive, so it is helpful to sort on *Latitude*. Only 10 of the 22 earthquakes listed occurred at positive latitude, so fewer than half of the earthquakes occurred north of the equator.

The correct answer is *No*.

24C. Recognize

To determine the number of earthquakes occurring between 10:00:00 and 20:00:00 GMT, it suffices to sort on *Time (GMT)* and then count. The 9 earthquakes appearing in positions 5 through 13 of the sorted list meet the criterion, but $\frac{9}{22} \neq \frac{1}{2}$.

The correct answer is *No*.

Answer 25

Infer

25A. Infer

The least possible mean corresponds to the case where each individual reported the minimum amount of time for their category (i.e., 5 people exercised 0 hours, 3 people exercised 1 hour, and so on). The mean in this case would be

$$\frac{5(0)+3(1)+2(2)+4(3)+4(4)+5(5)+1(8)+1(10)}{5+3+2+4+4+5+1+1}=\frac{78}{25}=3.12$$

The correct answer is *3.12.*

25B. Infer

A respondent who averaged less than one-half hour of exercise per day would have reported less than 3.5 hours of exercise for the week. There were 10 respondents who reported exercising less than 3 hours per week: those respondents necessarily averaged less than one-half hour of exercise per day. There were 11 respondents who reported exercising more than 4 hours for the week: those respondents necessarily averaged more than one-half hour of exercise per day.

There were 4 respondents who reported exercising at least 3 hours but no more than 4 hours for the week. It is possible that all 4 of these respondents reported more than 3.5 hours of exercise, in which case only 10 respondents would have averaged less than one-half hour of exercise per day. It is also possible, however, that 1 or more of these 4 respondents reported fewer than 3.5 hours, in which case, up to 14 respondents would have averaged less than one-half hour of exercise per day.

The correct answer is *10 and 14.*

Answer 26

Infer

26A. Infer

According to the graph, 45% of the residents were children or teenagers and 17% were seniors. Therefore there were $\frac{45}{17} \approx 2.65$ times as many residents who were children or teenagers than were seniors.

The correct answer is *2.65*.

26B. Infer

According to the graph, at the time of the census, 68% of residents were aged 0–39 and 32% were aged 40 or greater. If P represents the total population of Town Y, then $540 = (0.68)P - (0.32)P$. Therefore, $540 = 0.36P$, so $P = \frac{540}{0.36} = 1{,}500$.

The correct answer is *1,500*.

Answer 27

Recognize

27A. Recognize

The building with the greatest mean height per floor is represented by the uppermost black square on the graph. The horizontal coordinate of this square indicates that the roof height of the building is between 350 and 370 meters.

The correct answer is *350 and 370.*

27B. Recognize

Where the red dots are in the upper portions of the graph, the corresponding black squares are generally in the lower regions. Similarly, where the red dots are in the lower portions of the graph, the corresponding black squares are generally in the upper regions. This demonstrates a strong negative correlation between the variable represented by the vertical coordinates of the red squares and the variable represented by the vertical coordinates of the black squares. Thus there is a strong negative correlation between the number of floors and the mean height per floor.

The correct answer is *strong negative.*

Answer 28

Recognize; Infer

28A. Recognize

Of the four noncash methods represented in the graph, only *paper check* showed an increase from 2006 to 2009. Indeed, the number of paper check transactions increased from 24 million in 2006 to 30 million in 2009. This indicates a percentage increase of $\left(\frac{30-24}{24}\right)100\% = 25\%$.

The correct answer is *paper check.*

28B. Infer

The average value of all credit card transactions in 2006 was $\frac{T}{22,000,000}$, where T is the total value of all credit card transactions in 2006. If the total value of all credit card transactions in 2009 was 10% more than the total value of all credit card transactions in 2006, then the total value of all credit card transactions in 2009 was $1.1T$. Therefore, the average value of all credit card transactions in 2009 was $\frac{1.1T}{20,000,000}$.

If the average value of credit card transactions increased by x% from 2006 to 2009, then $\left(\frac{100+x}{100}\right)\frac{T}{22,000,000} = \frac{1.1T}{20,000,000}$.

Therefore, $\frac{100+x}{100} = \frac{1.1(22,000,000)}{20,000,000}$

$= \frac{121}{100}$.

Thus, $100 + x = 121$, so $x = 21$.

The correct answer is *21.0.*

Answer 29

Infer

29A. Infer

Among all of the babies in the study, the graph shows that greater lengths tend to correspond to greater weights. This indicates a strongly positive correlation between length and weight.

The correct answer is *strongly positive.*

29B. Infer

In the graph there are 4 blue circles and 6 triangles below the horizontal line at 3.5 kg. This indicates that 10 babies in the study weighed less than 3.5 kg, and that of these 10, 4 were in Group A. Thus the probability that the randomly selected baby was a part of Group A is $\frac{4}{10} = 0.40$.

The correct answer is *0.40.*

Answer 30

Infer

30A. Infer

Since the white circles (connected by blue lines) and the filled squares (connected by black lines) in the graph are consistently at or above the empty squares (connected by dotted lines), it follows that both ABC Cars and XYZ Automotive were at or above the citywide average for every single month in 2010. Thus their combined sales must have been greater than the combined sales of the two dealers not included in the graph. Therefore ABC Cars and XYZ Automotive must have accounted for more than half of all used-car sales in City Z in 2010.

The correct answer is *more than.*

30B. Infer

In June 2010, the citywide average was 26 cars. This means that the four dealers sold a combined 4(26) = 104 cars. Of those 104 cars, ABC Cars sold 30 and XYZ Automotive sold 28. This implies that the other two dealers sold 104 – 30 – 28 = 46 cars.

The correct answer is *46.*

Answer 31

Infer

31A. Infer

The graph indicates that there were approximately 700 million Internet users in 2002 and approximately 1,400 million in 2007. Thus, between 2002 and 2007, the percent increase in the number of Internet users was approximately $(\frac{1,400 - 700}{700})(100)\% = 100\%$.

The correct answer is *100*.

31B. Infer

The graph indicates that in 2000 the population was approximately 6,100 million, of whom approximately 400 million were Internet users, and in 2010 the population was approximately 6,875 million, of whom approximately 2,100 million were Internet users. Thus, in 2000 there were $100(\frac{400}{6,100}) \approx 6.6$ Internet users per 100 people, and in 2010 there were $100(\frac{2,100}{6,875}) \approx 30.5$ Internet users per 100 people. Therefore, from 2000 to 2010, the number of Internet users per 100 people increased by approximately $30.5 - 6.6 = 23.9 \approx 24$.

The correct answer is *24*.

Answer 32

Infer

32A. Infer

According to the graph and the accompanying text, 25% of the Day 1 shoppers returned on Day 2, and 19% of those shoppers subsequently returned on Day 3. Thus, on Day 3, $100(.25)(.19) = 4.75\%$ of Day 1 shoppers returned to the store.

The correct answer is *Between 1 and 10*.

32B. Infer

Day 1 shoppers who purchased an item in place of Product X paid, on average, 130% of the amount that they would have paid for Product X. According to the graph, 60% of Day 1 shoppers chose to buy an alternative product on Day 1. The total spent by these shoppers, as a fraction of the total all Day 1 shoppers would have spent had each instead bought Product X, is $\frac{(60)(130)}{(100)(100)} = \frac{7,800}{10,000}$, or 78%.

The correct answer is *78*.

Answer 33

Infer

33A. Infer

There is a noticeable decrease in consumption for all four categories immediately prior to 1922, most markedly for carbohydrates and fat, and more subtly for protein and fiber, thereby strongly suggesting that there was an overall food shortage at that time.

The other options can be ruled out: for several years prior to 1961, consumption of fat and fiber appears unchanged, whereas, prior to 2000, there appears to be a steady increase in the consumption of protein and fiber.

The correct answer is *1922*.

33B. Infer

Consumption of carbohydrates appears to have been lowest between 1961 and 1967. At that time the average consumption of carbohydrates was approximately 384 g, and that of fiber, approximately 21 g. Thus, at that time, carbohydrate consumption was approximately $\frac{384}{21} \approx 18.29$ times that of fiber.

The correct answer is *18*.

Answer 34

Infer

34A. Infer

Measured in thousands, the estimated year-end population of Territory C was approximately 2,900 in 1990 and 4,600 in 2010, for an increase of approximately 4,600 – 2,900, or 1,700, over that period. The total estimated year-end population of Nation X, in thousands, was 17,000 in 1990 and 22,500 in 2010, an increase of 22,500 – 17,000, or 5,500. Thus, Territory C's population increase represents $100(\frac{1,700}{5,500}) \approx 30.91$ percent of the total increase.

The correct answer is *30*.

34B. Infer

Measured in thousands, the 2010 estimated year-end population was approximately 7,250 for Territory A, approximately 5,600 for Territory B, and approximately 4,600 for Territory C, for a combined total of approximately 17,450. The estimated total year-end population, in thousands, of Nation X for 2010 was 22,500. Thus the estimated total of the three territories represents $100(\frac{17,450}{22,500}) \approx 77.56$ percent of the estimated year-end total population of Nation X in 2010.

The correct answer is *between 70% and 80%.*

Answer 35

Infer

The passage strongly suggests that liquid water is necessary for the formation of rock varnish containing manganese, and for the movement of limonite (and rock varnish consisting only of limonite). The frozenness of the Thiel Mountains is suggested as an explanation of the absence of manganese in the rock varnish there, suggesting that temperatures on the rocks are also below freezing.

35A. Infer

The passage states that limonite had penetrated the cracks. This suggests that the limonite had moved from the surface of the rock, which in turn very strongly suggests (with the above) that temperatures on the rocks were above freezing at some point. Because the rocks are continuously frozen at present, it can be inferred that temperatures on the rocks must have been above freezing at some point in the past (statement F).

Although the passage as a whole rather strongly suggests that rock varnish in continuously frozen areas tends to be especially rich in iron, any suggestion that rock varnish especially rich in iron tends not to exist outside of extremely cold areas is at best very weak. It would therefore be a mistake to choose D as the True statement (over F).

Because statement B is the negation of statement A, it may seem likely that one or the other is true. And indeed, the passage cites an absence of moisture as an explanation for an absence of manganese in certain places. However, not enough information is given to infer whether or not moisture is required for the presence of significant amounts of manganese in the environment.

The correct answer is F, *Temperatures on rocks in the Thiel Mountains were above freezing at some point in the past.*

35B. Infer

Given the strong suggestion, with the correct answer in 35A, that temperatures on rocks in the Thiel Mountains were above freezing at some point in the past, together with the statement that rock varnish in the Thiel Mountains (including rock varnish in the cracks of rocks) consists only of limonite, we find a suggestion that manganese need not begin to penetrate cracks in rocks in every case in which temperatures in a continuously frozen location increase to above freezing. This suggests that statement C may be false. This suggestion is much stronger than any such suggestion with respect to the other given statements in the table.

The correct answer is *C, When temperatures in a continuously frozen location increase to above freezing, cracks in rocks there begin to take in rock varnish containing significant amounts of manganese.*

Answer 36

Apply

Before any rounds are completed, there are 512 players, each on exactly one team of two players. Therefore there are 256 teams in the competition. After each round, half of the teams are eliminated. The following table summarizes the results after each round of the tournament.

Rounds completed	1	2	3	4	5	6	7	8
Teams remaining	128	64	32	16	8	4	2	1

The only available combination of rounds completed and number of teams remaining is 4 rounds completed and 16 teams remaining.

36A. Apply

The correct answer is B, *4.*

36B. Apply

The correct answer is D, *16.*

Answer 37

Infer

We are asked to provide a sequence of cause and effect that would (according to the naturalist) result in coral reef decline. The question suggests that the answers will be dependent on one another, in that the correct answer in 37A will depend on the correct answer in 37B, and vice versa.

The passage states that one factor contributing to coral reef decline is predation on coral by organisms such as the crown-of-thorns sea star. The preferred food source for this organism is coral polyps, and so a causal sequence that has as its effect an increase in crown-of-thorns sea stars may be likely to produce a decline in coral reefs. This suggests that C may be the correct response in 37B. However, this depends on whether one of the other statements in the table describes a cause suggested by the naturalist to produce this effect.

The last sentence of the naturalist's statement indeed suggests, in the context of the passage, that an increase in phytoplankton blooms would result in greater numbers of crown-of-thorns sea stars. This suggests that A may be the correct response for 37A. And indeed, according to the naturalist, the crown-of-thorns sea star's preferred food source is coral polyps. All of the naturalist's statement is about possible explanations of the decline of coral reefs. The passage therefore indicates that the naturalist would take an increase in phytoplankton (A, cause) to produce an increase in crown-of-thorns sea stars (C, effect), and that this causal sequence would result in coral reef decline.

37A. Infer

The correct answer is A, *An increase in phytoplankton.*

37B. Infer

The correct answer is C, *An increase in crown-of-thorns sea stars.*

Answer 38

Apply

The formula may only be applied for y greater than $2\sqrt{3}$, therefore the only options available for b are 4, 6, and 8.

If $f(a) = b$ and $b = 4$, then, according to the formula, $a = \frac{4^2 + 12}{4} = \frac{28}{4} = 7$.

Since 7 is not an option, $b = 4$ is not part of the correct response.

If $f(a) = b$ and $b = 6$, then, according to the formula, $a = \frac{6^2 + 12}{6} = \frac{48}{6} = 8$.

Since 8 is an option, $a = 8$ and $b = 6$ must be the correct response.

38A. Apply

The correct answer is E, *8.*

38B. Apply

The correct answer is D, *6.*

Answer 39

Infer

This item asks for a possible fact and an assumption of the argument such that the possible fact supports the assumption. This suggests that the correctness of the answer for one response opportunity could depend on the correctness of the answer for the other.

39A. Infer

Only one of the statements in the table is an assumption required by the archaeologist's argument. If the next cup recovered from the archaeological site is not made of porcelain, then the evidence provided by the archaeologist has no relevance regarding where the next cup recovered from the site was made. This indicates that C may be the correct response for 39A.

In contrast, A, although a strengthener of the argument, is not a required assumption: we could, for example, have other reasons for believing that the next cup will be made of porcelain. Statement F would also be an important strengthener, but it is not required for the reasoning of the argument to be sound.

The correct answer is C, *The next cup to be recovered from the site will likely be made of porcelain.*

39B. Infer

Given that C is the required assumption within the list in the table, the possible fact asked for in the question must be a possible fact that provides significant logical support for this statement. (Because the question specifies that two *different* statements must be selected, the *possible fact* cannot be C.)

The correct answer is A, *Other cups have been recovered from the archaeological site, all of which were made of porcelain.*

Answer 40

Apply

40A. Apply

If Laszlo reviews a document, so must his supervisor, Davi, and Davi's supervisor, Adiliah. If Laszlo is the initial reviewer, then exactly 3 department members would review the document. However, if Laszlo reviews a document but is not the initial reviewer, the initial reviewer must be either Saleema or Yarah for a maximum total of 4 reviewers of the document.

The correct answer is D, *4.*

40B. Apply

If Adiliah reviews a document, no department members will review the document after her. If Adiliah is the initial reviewer, then, exactly 1 department member will review the document. If Bao or Davi is the initial reviewer, then the document will be reviewed by exactly 2 department members. If Laszlo is the initial reviewer, then the document will be reviewed by exactly 3 department members. Finally, if Saleema or Yarah is the initial reviewer, then exactly 4 department members will review the document. Since no one else can be the initial reviewer, 4 must be the maximum number of reviewers of a single document for which Adiliah is among the reviewers.

The correct answer is D, *4.*

Answer 41

Infer

The question asks for a possible characteristic of a group and a prediction about the group such that knowledge that the group has the characteristic would support the prediction. The question suggests that the answers for the two response opportunities may be dependent, such that the correctness of the answer for one response opportunity depends on the correctness of the answer for the other.

The evidence from the archeologist might support a prediction that the group uses thin-walled pots, on the basis of the group's being sedentary rather than nomadic. The evidence might also support the prediction that the group is nomadic rather than sedentary, on the basis of its using thin-walled pots. However, the archaeologist states that a prediction can be made about pottery use. The archaeologist thus most strongly suggests that usage of thin-walled pots by a group can be predicted on the basis of the group's being sedentary rather than nomadic.

41A. Infer

The correct answer is A, *The group is sedentary rather than nomadic.*

41B. Infer

The correct answer is C, *The group uses thin-walled pots.*

Answer 42

Infer

For the given right circular cylinder, let V denote the volume (in cubic meters); let h denote the height (in meters); and let r, d, and A denote the radius (in meters), diameter (in meters), and area (in square meters), respectively, of the circular base. According to the given conditions, h, $\frac{1}{4}V$, and A are all equal.

42A. Infer

The volume of a right circular cylinder is equal to the area of its base times its height, so $V = Ah$. Substituting Ah for V in the right-hand side of the equality $h = \frac{1}{4}V$ yields $h = \frac{1}{4}Ah$, from which it follows that $A = 4$. Since $A = \pi r^2$, it follows that $\pi r^2 = 4$ and hence $r = \sqrt{\frac{4}{\pi}} = \frac{2}{\sqrt{\pi}}$. Since the diameter of a circle is equal to twice the radius, it follows that $d = 2r = \frac{4}{\sqrt{\pi}}$.

The correct answer is B, $\frac{4}{\sqrt{\pi}}$.

42B. Infer

Substituting Ah for V, this time in the left-hand side of the equality $\frac{1}{4}V = A$, yields the equation $\frac{1}{4}Ah = A$. A cannot be zero, so dividing both sides of this last equation by A yields $\frac{1}{4}h = 1$, from which it follows that $h = 4$.

The correct answer is C, *4.*

Answer 43

Infer

The wording of the question suggests that the correctness of an answer for one of the response opportunities will depend on the correctness of the answer to the other. We are to find a statement in the table such that the information indicates Professor A would likely disagree with the first statement and Professor B would take the second statement to present evidence against the first.

43A. Infer

The only statement in the table that the dialogue strongly suggests Professor A would disagree with is C. For example, if the relative distribution of spending by the *aid industry* between *primary schools in the poorest areas, medicines and other basic supplies for health care such as mosquito nets,* and the *few key agricultural initiatives* is maintained, while spending in other areas is drastically reduced, then the aid industry will thereby focus its spending more on primary education than it now does.

The correct answer is C, *The aid industry should focus its spending less on primary education than it now does.*

43B. Infer

Given the answer for 43A, the question requires identification of the statement within the table that Professor B would take to be evidence for the statement that the aid industry should focus its spending less on primary education than it now does. The claims attributed to Professor B, in the context of the dialogue with Professor A, strongly suggest that she would take such evidence to be provided by statement F.

The correct answer is F, *Projects in education are more likely to be successful if they are paid for by local people.*

Answer 44

Infer

Since the speed of the car increases at a constant rate, the car's average speed, in meters per second, over the 10-second period is equal to $\frac{1}{2}(v_0 + v_{10})$. Thus the distance the car traveled, in meters, over that period is equal to $\frac{1}{2}(v_0 + v_{10})(10)$, or $5(v_0 + v_{10})$. But this value is given to be 125, so it must be true that $v_0 + v_{10} = \frac{125}{5}$, or 25. Because speed must be positive, both v_0 and v_{10} must be less than 25, ruling out 36 and 72 as possible values.

44A. Infer

Among the available alternatives—5, 18, and 20—the only pair that sum to 25 are 5 and 20. Since the speed is increasing, it must also be true that $v_0 \leq v_{10}$. Therefore $v_0 = 5$.

The correct answer is A, *5.*

44B. Infer

Following the analysis for 44A, the value of v_{10} must correspond to $v_0 = 5$: $5 + v_{10} = 25$, so $v_{10} = 20$.

The correct answer is C, *20.*

Answer 45

Infer

The wording of the passage suggests that the answers for 45A and 45B may depend on one another, in that the correctness of one response may depend on the correctness of the other.

Although volcanoes emit various gases, such emissions are not claimed by the journalist to have brought about the end of the Triassic. The journalist indicates that volcanic eruptions were an indirect cause of the end of the Triassic. The eruptions might thus have been a cause of the end of the Triassic, but only because of certain effects that they had. The journalist then indicates that the release of methane from the bottom of the ocean was the direct cause of the end of the Triassic. This very strongly suggests that, according to the journalist, the eruption of volcanoes (C)—an indirect cause of the end of the Triassic—resulted in a release of methane from the bottom of the ocean (E), which in turn resulted in the end of the Triassic.

45A. Infer

The correct answer is C, *The eruption of volcanoes.*

45B. Infer

The correct answer is E, *The release of methane from the bottom of the ocean.*

Answer 46

Infer

For $n = 1$, the equation $s_{n+2} = (s_n)^2 - s_{n+1}$ is equivalent to $s_3 = (s_1)^2 - s_2$. For $n = 2$, the equation $s_{n+2} = (s_n)^2 - s_{n+1}$ is equivalent to $s_4 = (s_2)^2 - s_3$, and substituting $(s_1)^2 - s_2$ for s_3 yields $s_4 = (s_2)^2 - (s_1)^2 + s_2$. (Continuing in this fashion, it is possible to produce, for each positive integer n, an expression for s_n in terms of s_1 and s_2.) Substituting 1 for s_2 in the equation for s_4, it follows that the values of s_1 and s_4 are related by the equation $s_4 = 2 - (s_1)^2$. One strategy is to substitute each value in the table for s_1 to see if the corresponding value of s_4 is present.

46A. Infer

Because the value of $(s_1)^2$ is nonnegative and increases rapidly as the absolute value of s_1 increases, it makes sense to begin testing possible values for s_1 at the bottom of the table. When s_1 is equal to 0 or -1, the quantity $2 - (s_1)^2$ is positive, so the corresponding value of s_4 does not appear. When $s_1 = -3$, the corresponding value of s_4 is $2 - (-3)^2 = -7$, which is present in the table. Note that when $s_1 \leq -7$, it follows that $2 - (s_1)^2 \leq 2 - 49$, so the corresponding value of s_4 is less than or equal to -47 and hence cannot appear in the table. So the value of s_1 must be -3.

The correct answer is C, *−3.*

46B. Infer

Following the analysis for 46A, the value of s_4 must correspond to $s_1 = -3$, and it is given by $s_4 = -7$.

The correct answer is B, *−7.*

Answer 47

Evaluate

47A. Evaluate

If the researchers had posed the same questions to 5-year-old French and Mundurucú children as they posed the 7-to-13-year-old children, the results may or may not have corroborated the researchers' conclusion.

If, however, the Mundurucú children who were 5 years old had the same difficulty in answering the questions as their North American counterparts, then the researchers would have further evidence that the ability is not present in children under the age of 5 but appears to develop thereafter.

The correct answer is C, *Mundurucú children who were 5 years old had just as much trouble answering the questions as did the 5-year-old North American children.*

47B. Evaluate

If it were true that North American children 7 to 13 years old had much more trouble answering the questions than did the Mundurucú children of the same ages, then this would provide some evidence that the ability is not innate.

The correct answer is A, *North American children 7 to 13 years old had much more trouble answering the questions than did the Mundurucú of the same ages.*

Answer 48

Apply

48A. Apply

Each employee description must be checked to see if it meets the criteria for verbal warning, but not for written reprimand: accumulating at least 3, but fewer than 4, unexcused absences within a 365-day period. The employee described in option A had 4 unexcused absences, but no more than 2 of these occurred within a single 365-day period, so the employee did not qualify for a verbal warning.

Likewise, the employee in option B did not qualify for a verbal warning: the employee reduced the absence on 13 May 2010 from a full day to half a day by staying late and working an extra hour, and thus had only $2\frac{1}{2}$ absences during the 365-day period beginning 13 May, and no more than 2 absences within any other 365-day period.

In option C, the 4.5-hour absence on 19 March 2010 counts as a full day's absence and is not offset by the extra hour because it was not worked on the same day. Therefore, the employee in option C had exactly 3 unexcused absences in the 365-day period beginning on 19 March 2010—enough for a verbal warning, though not a written reprimand.

In option D, the employee was absent between 10 minutes and 2 hours on 15 and 19 September, between 2 hours and 4 hours on 13 and 18 September, and more than 4 hours on 16 September. Thus, in that single 365-day period, the employee accumulated $(2)\left(\frac{1}{3}\right) + (2)\left(\frac{1}{2}\right) + 1$, or $2\frac{2}{3}$ total absences, which falls just short of 3 absences and thus does not qualify for a verbal warning.

In option E, during the 365-day period beginning on 7 July 2010, the employee had a 3-hour (half-day) absence, a 2.5-hour (half-day) absence, two all-day (full-day) absences, and a 5-hour (full-day) absence, for a total of $(2)\left(\frac{1}{2}\right) + (2)(1) + 1$, or 4 absences. This employee meets the criteria for a verbal warning, but also for a written reprimand, and hence option E is not correct here.

The correct answer is C, *Absent 4.5 hours on 19 March 2010; stayed 1 hour late on 20 March 2010; absent all day on 8 February 2011 and 9 February 2011; arrived 40 minutes late on 17 April 2011.*

48B. Apply

As noted in the analysis for 48A, the employee in option E meets the criteria for both a verbal warning and a written reprimand, and hence option E is the answer. Also by the previous analysis, the employees in options A, B, and D do not meet the criteria for verbal warning, and hence cannot meet the criteria for written reprimand. While a verbal warning is warranted in option C, the employee has fewer than 4 absences in a 365-day period and thus does not merit a written reprimand.

The correct answer is E, *Absent 3 hours on 7 July 2010; absent 2.5 hours on 13 September 2010; absent all day on 31 January 2011 and 4 July 2011; absent 5 hours on 12 March 2011.*

Answer 49

Strategize

49A. Strategize

This requires consideration of all the strategy options, A through E, to determine which one would lead most directly to decreasing expenses for Metro Ballet's classical ballet productions. Obtaining public funding to double the spending on stage productions without increasing ticket prices (option A) would lead to an *increase* in expenses for ballet productions, although those expenses should be offset by public funding. If expanding productions to include modern, folk, and tap dance traditions (option C) had the effect of decreasing expenses associated with ballet, that effect would be indirect. Offering discounts to reward people who have attended the greatest number of performances (option D) would likely reduce revenue and therefore increase expenses associated with ballet productions. Mounting an advertising campaign emphasizing the affordability and excitement of the ballet's spectacular productions (option E) should increase expenses in the short term, although it may lead to increased revenue in the long term. Only the strategy of returning spending on productions to the level of several years ago (option B) has the immediate effect of decreasing expenses associated with classical ballet productions.

The correct answer is B, *Return spending on productions to levels of several years ago.*

49B. Strategize

It is again necessary to consider all the options. It is unclear how the strategy of doubling spending on stage productions without raising ticket prices (option A) would address the problem of attracting a larger audience, unless the process of obtaining public funding entailed an advertising campaign. Since the current audience has become accustomed to lavish productions, a reduction in spending on ballet productions (option B) might actually *reduce* that audience. Expanding productions to include different dance traditions (option C) might attract a larger audience, but only if these traditions appeal to people not currently attending Metro Ballet, and only if they are made aware of the new productions. Since most people in the current audience have already been attending Metro Ballet productions for a number of years, offering discounts to those who have already attended a great number of performances (option D) may reinforce their loyalty, but is unlikely to attract people who haven't previously attended. An advertising campaign aimed at addressing the reasons why area residents surveyed don't currently attend (option E), however, would constitute the most direct attempt to increase audience size among the options listed.

The correct answer is E, *Mount a local advertising campaign emphasizing the affordability and excitement of Metro Ballet's spectacular stage productions.*

Answer 50

Strategize

While changes to the newspaper or television advertising strategy may affect mattress sales, those changes would not necessarily clarify the effect radio advertising has had on mattress sales.

Even if changing the content of the radio advertising in either city were to bring about an increase in mattress sales, it may not be possible to determine if the consultant's claim were correct. If the previous content had a negligible or a positive effect on sales, then an increase in sales coinciding with the change of content would be evidence that the consultant's claim was incorrect. On the other hand, if the previous content had a negative effect on sales, then the new content may simply have had less of a negative effect.

The best way to determine if radio advertising does not improve mattress sales is to eliminate radio advertising in both cities. Any change in sales may be attributed to the radio advertising, indicating whether the consultant's claim was correct. If there was no change, the consultant's claim would be strongly supported.

50A. Strategize

The correct answer is C, *Eliminate radio advertising.*

50B. Strategize

The correct answer is C, *Eliminate radio advertising.*