GMAT 2019 Question Paper with Solutions

Time Allowed : 3 Hours	**Maximum Marks :** 100

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The GMAT exam is 2 hours and 15 minutes long (with one optional 10-minute break) and consists of 64 questions in total.
2. The GMAT exam is comprised of three sections:
3. Quantitative Reasoning: 21 questions, 45 minutes
4. Verbal Reasoning: 23 questions, 45 minutes
5. Data Insights: 20 questions, 45 minutes
6. You can answer the three sections in any order. As you move through a section, you can bookmark questions that you would like to review later.
7. When you have answered all questions in a section, you will proceed to the Question Review & Edit screen for that section.
8. If there is no time remaining in the section, you will NOT proceed to the Question Review & Edit screen and you will automatically be moved to your optional break screen or the next section (if you have already taken your optional break).
9. Each Question Review & Edit screen includes a numbered list of the questions in that section and indicates the questions you bookmarked.
10. Clicking a question number will take you to that specific question. You can review as many questions as you would like and can edit up to three (3) answers.

1. For chocolates prevalent in the market and consumed widely by children, if the absence of labeling that indicates the ingredients seems dangerous, then the certifying body can require that the chocolate undergoes paediatric study.

(A) that the chocolate undergoes
(B) that the chocolate undergo
(C) that the chocolate is to undergo
(D) the chocolate undergoing
(E) the chocolate to have to undergo

Correct Answer: (A) that the chocolate undergoes

Solution:
Step 1: Understanding the structure of the sentence.
In the sentence, the phrase "require that" is followed by a noun clause, which is commonly constructed using the base form of the verb (without any additional auxiliary verbs). Therefore, the correct answer should have the verb in its base form, which is "undergoes."
Step 2: Analysis of options.
- (A) that the chocolate undergoes: Correct. The verb "undergoes" is in its correct form following "require that."
- (B) that the chocolate undergo: Incorrect. The verb "undergo" is in the base form, which is grammatically incorrect in this context.
- (C) that the chocolate is to undergo: Incorrect. The construction "is to undergo" introduces unnecessary complexity.
- (D) the chocolate undergoing: Incorrect. "Undergoing" is a present participle and does not fit the sentence structure here.
- (E) the chocolate to have to undergo: Incorrect. This construction is awkward and does not follow standard usage after "require that."
Step 3: Conclusion.
The correct answer is (A) that the chocolate undergoes, as it follows the standard grammar rule for "require that" clauses.

> **Quick Tip**
>
> After "require that," the verb in the noun clause should be in the base form (without any auxiliary verb).

While Artificial Intelligence was born prematurely in an era that treated it with skepticism, it overcame the challenges and now boasts of a present where machines perform highly specialized tasks. A few decades more and we may have Artificial General Intelligence (AGI) – machines that are capable of human-level performance on full range of tasks that at present we only can tackle.
But have we accounted for what this progress entails? The future prospects of AGI have led to a marked divide in the scientific community. On one hand, we have the Progressive Scientists who support AGI, and on the other we have the Ethical Scientists who consider the

flight to be as perilous as that of Icarus. The Progressive Scientists have maintained a cavalier attitude towards the fear expressed by the Ethical Scientists and have dismissed it as the fear of "unknown". They realize little that this doubt stems out, not from what is unseen but out of what exists. A look at the history shows that humans are themselves far from being reliably human-friendly. We do many terrible things to each other and to many other sensitive creatures with whom we share the planet. If super-intelligent machines can't prove to be a lot better than us, we'll be in deep trouble. We'll have powerful new intelligence amplifying the dark sides of our own fallible natures. Given how catastrophic the consequences could be, the disdain with which the Ethical scientists view the future of AGI does not seem misplaced.

2. The central idea of the passage is

(A) Discuss the origin of AGI
(B) Explain why AGI has failed to achieve its goal
(C) Compare the differences in the ideologies of Progressive and Ethical Scientists
(D) Discuss an oversight that can cost us dearly
(E) Revise a thought held by Ethical Scientists

Correct Answer: (C) Compare the differences in the ideologies of Progressive and Ethical Scientists

Solution:
Step 1: Identify the central theme of the passage.
The passage talks about the divide in the scientific community regarding the prospects of AGI. It discusses the Progressive Scientists' support for AGI and the Ethical Scientists' concerns. The key contrast is between their ideologies, focusing on the potential dangers of AGI.
Step 2: Analysis of options.
- (A) Discuss the origin of AGI: The passage doesn't primarily discuss the origin of AGI but rather its future implications.
- (B) Explain why AGI has failed to achieve its goal: This is not the focus of the passage. It discusses the future potential of AGI, not its failure.
- (C) Compare the differences in the ideologies of Progressive and Ethical Scientists: Correct. The central idea is the contrast between Progressive and Ethical Scientists' views on AGI.
- (D) Discuss an oversight that can cost us dearly: The passage does mention possible dangers, but this is not the central theme.
- (E) Revise a thought held by Ethical Scientists: The passage doesn't focus on revising thoughts but on the ideological divide.
Step 3: Conclusion.
The correct answer is (C) as the passage focuses on comparing the differing views of Progressive and Ethical Scientists regarding AGI.

Quick Tip

To identify the central idea, focus on the main comparison or contrast discussed in the passage.

3. The view that "this doubt stems out, not from what is unseen but out of what exists" refers to which one of the following?

(A) Resistance of Ethical Scientists
(B) Progressive Scientists' belief that the fear of unknown leads to the skepticism of the Ethical Scientists
(C) Ethical Scientists' fear of the "unknown"
(D) Author's belief that there was a lack of consensus between the Ethical and the Progressive Scientists
(E) Ethical Scientists' fear of the consequences of what this progress entails

Correct Answer: (E) Ethical Scientists' fear of the consequences of what this progress entails

Solution:
Step 1: Understand the context of the phrase.
The phrase "this doubt stems out, not from what is unseen but out of what exists" suggests that the fear or doubt is not about the unknown, but about what already exists in human history and the potential consequences of AGI.
Step 2: Analysis of options.
- (A) Resistance of Ethical Scientists: This doesn't directly align with the phrase about doubt stemming from what exists.
- (B) Progressive Scientists' belief that the fear of unknown leads to the skepticism of the Ethical Scientists: This contradicts the phrase since it refers to the known dangers, not the unknown.
- (C) Ethical Scientists' fear of the "unknown": This is incorrect because the phrase contrasts the fear of the known (existing issues) with the unknown.
- (D) Author's belief that there was a lack of consensus between the Ethical and the Progressive Scientists: This is about the ideological divide, not the source of doubt.
- (E) Ethical Scientists' fear of the consequences of what this progress entails: Correct. The phrase refers to the existing dangers humans have created, which Ethical Scientists fear will be amplified by AGI.
Step 3: Conclusion.
The correct answer is (E), as the phrase highlights the fear of the consequences of progress, not the unknown.

> Quick Tip
>
> Look for clues in the passage that indicate what is feared: the unknown or the consequences of current realities.

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4. The author of the passage asserts which one of the following about the Progressive scientists?

(A) They attacked the Ethical Scientists in an unrestrained manner

(B) They underscored the problems foreseen by the Ethical Scientists
(C) They need to be more serious about the questions raised by the Ethical Scientists
(D) They were correct in avoiding doubts raised by the Ethical Scientists
(E) Though they were treated with skepticism, they overcame the challenges

Correct Answer: (E) Though they were treated with skepticism, they overcame the challenges

Solution:
Step 1: Understand the author's view.
The passage suggests that the Progressive Scientists, despite facing skepticism, continued their work and overcame challenges, showing perseverance.
Step 2: Analysis of options.
- (A) They attacked the Ethical Scientists in an unrestrained manner: This is not mentioned in the passage. The Progressive Scientists dismiss the concerns, but not in an unrestrained way.
- (B) They underscored the problems foreseen by the Ethical Scientists: The Progressive Scientists dismiss these problems rather than underscore them.
- (C) They need to be more serious about the questions raised by the Ethical Scientists: This is not implied in the passage; they dismiss the Ethical Scientists' concerns.
- (D) They were correct in avoiding doubts raised by the Ethical Scientists: The passage does not explicitly state that they were correct. They simply dismissed the concerns.
- (E) Though they were treated with skepticism, they overcame the challenges: Correct. The Progressive Scientists faced skepticism but overcame it and continued their work.
Step 3: Conclusion.
The correct answer is (E).

Quick Tip

Look for words in the passage that emphasize persistence or overcoming challenges, as in this case.

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5. What is the attitude of Progressive Scientists towards Ethical Scientists?

(A) spiteful and envious
(B) Reverent and idolatry
(C) ignorant and condescending
(D) ambivalent but deferential
(E) uncertain but interested

Correct Answer: (C) ignorant and condescending

Solution:
Step 1: Analyze the Progressive Scientists' attitude.
The passage describes the Progressive Scientists as dismissive of the concerns raised by the Ethical Scientists, suggesting an attitude of ignorance towards the fears of the Ethical Scientists and a condescending dismissal of their arguments.

Step 2: Analysis of options.
- (A) spiteful and envious: This is not indicated. They are dismissive, not spiteful.
- (B) Reverent and idolatry: This contradicts the passage, as the Progressive Scientists do not show reverence to the Ethical Scientists.
- (C) ignorant and condescending: Correct. The Progressive Scientists dismiss the Ethical Scientists' concerns in a condescending way, showing ignorance of the issues raised.
- (D) ambivalent but deferential: The Progressive Scientists are not ambivalent, nor do they defer to the Ethical Scientists.
- (E) uncertain but interested: The passage does not describe the Progressive Scientists as uncertain or interested in the concerns of the Ethical Scientists.
Step 3: Conclusion.
The correct answer is (C).

> Quick Tip
>
> Look for words that describe how one group dismisses or treats another to understand the attitude.

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6. The results of the recent diet program that was launched early this year are evident in all the participants' average weight, which reduced by almost 7kg on an average during the first 2 months of the program after it increased by 8

(A) which reduced by almost 7kg on an average during the first two months of the program after it increased
(B) which had reduced by almost 7kg on an average during the first two months of the program after it had increased
(C) which has increased by almost 7kg on an average during the first two months of the program after it increased
(D) with a 7kg reduction on an average during the first two months of the program after increasing

Correct Answer: (B) which had reduced by almost 7kg on an average during the first two months of the program after it had increased

Solution:
Step 1: Understand the tense and structure.
The passage describes a sequence of events: first, the weight increased, and then it decreased. The correct option must reflect this past sequence using the past perfect tense ("had reduced").
Step 2: Analysis of options.
- (A) which reduced by almost 7kg on an average during the first two months of the program after it increased: Incorrect, as it uses the simple past tense, which doesn't reflect the prior increase properly.
- (B) which had reduced by almost 7kg on an average during the first two months of the program after it had increased: Correct. This option correctly uses the past perfect tense, reflecting the sequence of the weight increase and then reduction.

- (C) which has increased by almost 7kg on an average during the first two months of the program after it increased: Incorrect. This uses the present perfect tense, which doesn't fit the sequence.
- (D) with a 7kg reduction on an average during the first two months of the program after increasing: Incorrect. This structure is awkward and doesn't properly reflect the sequence of events.

Step 3: Conclusion.
The correct answer is (B).

> **Quick Tip**
>
> Pay attention to the tense when describing a sequence of events, especially with past actions.

The company Slim-fit released its low-cholesterol oil substitute into American Markets for the first time in history and gained no appreciable market share. Combatting this situation, company Slim-fit with a substantial marketing budget and a great fanfare scheduled the re-release of the oil, naming it the "new low- cholesterol alternative to oil."

7. Which of the following, if true, casts the most doubt on the effectiveness of the solution proposed above?

(A) In many American countries, satisfactory taste and low-cholesterol content are believed to be entirely contradictory.
(B) The market for oils such as coconut and palm has been slowly shrinking in many American countries due to the emergence of specialized cholesterol-free oils.
(C) Company Slim-fit could only feasibly maintain such a marketing budget for 10 to 12 months before scaling down the campaign.
(D) After Company Slim-fit attempted a similar marketing strategy in South Asia, the sales of the new product greatly increased.
(E) In California, the new low-cholesterol oil substitute achieved a market share of 10

Correct Answer: (A) In many American countries, satisfactory taste and low-cholesterol content are believed to be entirely contradictory.

Solution:
Step 1: Understand the context of the passage.
The passage talks about Slim-fit's attempt to market a low-cholesterol oil substitute with a substantial budget, facing a lack of market share. The solution involved a re-release with a substantial marketing budget. The question asks about factors that would cast doubt on this solution's effectiveness.
Step 2: Analysis of options.
- (A) In many American countries, satisfactory taste and low-cholesterol content are believed to be entirely contradictory: Correct. If consumers believe that low-cholesterol oil does not taste as good as regular oil, they may be less likely to purchase it, undermining the effectiveness of Slim-fit's re-release strategy.

- (B) The market for oils such as coconut and palm has been slowly shrinking in many American countries due to the emergence of specialized cholesterol-free oils: This is unrelated to Slim-fit's low-cholesterol oil substitute, as it focuses on a different market trend.
- (C) Company Slim-fit could only feasibly maintain such a marketing budget for 10 to 12 months before scaling down the campaign: This is an operational constraint but does not directly address the effectiveness of the proposed solution, which is about market reception.
- (D) After Company Slim-fit attempted a similar marketing strategy in South Asia, the sales of the new product greatly increased: This suggests success in another market but does not imply that the strategy will be equally effective in the American market.
- (E) In California, the new low-cholesterol oil substitute achieved a market share of 10

Step 3: Conclusion.
The correct answer is (A) because it directly challenges the potential success of Slim-fit's marketing strategy by highlighting a critical consumer belief about the product's taste.

> Quick Tip
>
> When evaluating the effectiveness of a solution, consider whether there are underlying consumer beliefs or market trends that may undermine the strategy.

Heavy consumption of Sodium causes a loss of fine motor skills, impaired judgment, a decrease in visual acuity, slower reaction times, and other short-term symptoms. Since Sodium can be metabolized in the average person's body at a rate of 0.018 BSC (or "blood Sodium content") per hour, a severely intoxicated individual with a BSC of 0.18 should be symptom-free after 12 hours. After this time, if the individual exhibits similar symptoms, such symptoms cannot be caused by Sodium.

8. Which of the following, if true, most seriously weakens the conclusion above?

(A) Some symptoms normally associated with Sodium consumption may resemble symptoms caused by prescription drugs or even drowsiness.
(B) Increases in BSC are based on the amount of Sodium consumed rather than the number of foods (some foods contain more Sodium than others).
(C) Heavy Sodium consumption has numerous long term effects such as stomach ulcers, cirrhosis of the liver, and birth defects.
(D) The metabolic rate of Sodium varies according to a person's weight, diet, health, and genetic predispositions.
(E) Some people, due to an acute sensitivity to Sodium, cannot even reach a BSC of 0.18 before becoming violently ill.

Correct Answer: (E) Some people, due to an acute sensitivity to Sodium, cannot even reach a BSC of 0.18 before becoming violently ill.

Solution:
Step 1: Analyze the conclusion of the passage.
The passage concludes that after 12 hours, a person with a BSC of 0.18 would be symptom-free, and symptoms after this time cannot be caused by Sodium. The question asks which statement weakens this conclusion.

Step 2: Analysis of options.
- (A) Some symptoms normally associated with Sodium consumption may resemble symptoms caused by prescription drugs or even drowsiness: This doesn't directly challenge the conclusion but provides a possible alternate cause for the symptoms.
- (B) Increases in BSC are based on the amount of Sodium consumed rather than the number of foods (some foods contain more Sodium than others): This is a general statement about Sodium but does not affect the conclusion regarding symptom onset and duration.
- (C) Heavy Sodium consumption has numerous long-term effects such as stomach ulcers, cirrhosis of the liver, and birth defects: While true, this does not address the immediate, short-term symptoms the passage discusses.
- (D) The metabolic rate of Sodium varies according to a person's weight, diet, health, and genetic predispositions: This is true, but it does not directly undermine the conclusion about the specific BSC level and symptom-free period.
- (E) Some people, due to an acute sensitivity to Sodium, cannot even reach a BSC of 0.18 before becoming violently ill: Correct. This directly weakens the conclusion by suggesting that some individuals may experience severe symptoms before reaching the stated BSC level of 0.18.
Step 3: Conclusion.
The correct answer is (E) because it presents a case where individuals may become ill even before reaching the BSC of 0.18, challenging the passage's assumption that a BSC of 0.18 guarantees symptom-free status after 12 hours.

> Quick Tip
>
> When evaluating an argument, look for options that introduce exceptions or counterexamples that challenge the general claim.

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9. The design of the neck muscles and the spinal bones of the molluscs allow that it can pull in the exposed parts of the body such that the predator doesn't find anything but a hard shell to bite.

(A) allow that it can pull in the exposed parts of the body such that
(B) allow it to pull in its exposed parts, such that
(C) allows that it can draw in its exposed parts, and so
(D) allows for it to draw in its exposed part, and that
(E) allows it to draw in its exposed parts, so that

Correct Answer: (E) allows it to draw in its exposed parts, so that

Solution:
Step 1: Understand the sentence structure.
The sentence needs to maintain correct syntax and meaning. The phrase "allows it to draw" is grammatically correct, and the use of "so that" implies the purpose or result of the action.
Step 2: Analysis of options.
- (A) allow that it can pull in the exposed parts of the body such that: "Allow that" is not the correct construction for this context.

- (B) allow it to pull in its exposed parts, such that: This is a reasonable option but does not flow as smoothly as (E).
- (C) allows that it can draw in its exposed parts, and so: "Allows that" is awkward and doesn't fit the sentence structure.
- (D) allows for it to draw in its exposed part, and that: This option is not idiomatic in terms of how English expresses such ideas.
- (E) allows it to draw in its exposed parts, so that: Correct. This option correctly uses "allows it to draw" and ends with "so that," which makes the purpose clear.

Step 3: Conclusion.
The correct answer is (E), as it uses the correct grammatical structure and clearly expresses the intended meaning.

> **Quick Tip**
>
> Use "allows [noun/pronoun] to [verb]" for a correct and smooth sentence structure.

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10. Three out of every five Apple phone users in China also use an Android phone.

(A) Three out of every five Apple phone users in China also use an Android phone.
(B) Out of every five, three Apple phone users in China also uses an Android phone.
(C) Android Phones are used by every three out of five Apple phone users in China.
(D) In China, three out of every five Apple phone users uses Android phones
(E) Out of every five Apple phone users in China, Android phones are used by three.

Correct Answer: (A) Three out of every five Apple phone users in China also use an Android phone.

Solution:
Step 1: Analyze the sentence for clarity.
The sentence needs to express the relationship between Apple and Android phone users clearly. The correct sentence structure for this type of ratio is: "Three out of every five [noun] [verb] [object]."
Step 2: Analysis of options.
- (A) Three out of every five Apple phone users in China also use an Android phone: Correct. This option clearly and correctly expresses the intended meaning.
- (B) Out of every five, three Apple phone users in China also uses an Android phone: This sentence is awkward and incorrectly places "three" at the beginning.
- (C) Android Phones are used by every three out of five Apple phone users in China: This sentence is grammatically incorrect and unclear.
- (D) In China, three out of every five Apple phone users uses Android phones: "Uses" should be "use" to match the plural subject.
- (E) Out of every five Apple phone users in China, Android phones are used by three: This option has a convoluted structure and is harder to understand.

Step 3: Conclusion.
The correct answer is (A), as it is clear and grammatically correct.

Quick Tip

In sentences expressing proportions, structure them as "X out of every Y [noun] [verb] [object]."

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11. In the state of California, the number of people who this year died due to heart attack are less than cancer.

(A) are less than
(B) are fewer than
(C) is less than those who died due to
(D) is less than the number of people who died due to
(E) is less than that of people who died due to

Correct Answer: (D) is less than the number of people who died due to

Solution:
Step 1: Analyze the sentence for subject-verb agreement.
The subject of the sentence "the number of people" is singular, so the verb should be "is," not "are." Additionally, the comparison should be made using "the number of people who died due to."
Step 2: Analysis of options.
- (A) are less than: Incorrect. The subject is singular, so the verb should be "is," not "are."
- (B) are fewer than: Incorrect for the same reason as option (A).
- (C) is less than those who died due to: "Those" is incorrect because it doesn't properly refer to "the number of people."
- (D) is less than the number of people who died due to: Correct. This option correctly uses "is" and provides a proper comparison.
- (E) is less than that of people who died due to: "That of" is awkward and not as grammatically correct as "the number of people."
Step 3: Conclusion.
The correct answer is (D), as it matches both subject-verb agreement and makes the comparison logically clear.

Quick Tip

When comparing quantities, make sure to use the correct subject-verb agreement and clarity in the comparison structure.

The genius of American democracy comes not from any special virtue of the American people but from the unprecedented opportunities of this continent and from a peculiar and unrepeatable combination of historical circumstances. These circumstances have given our institutions their character and their virtues. The very same facts which explain these virtues, explain also our inability to make a “philosophy” of them. They explain, therefore, why we have nothing in the line of a theory that can be exported to other peoples of the world. We should not ask others to adopt our “philosophy” because we have no philosophy which can be exported. My argument is simple. It is based on forgotten commonplaces of American history—facts so obvious that we no longer see them. I argue, in a word, that American democracy is unique. It possesses a “genius” all its own. By this I mean what the Romans might have described as the tutelary spirit assigned to our nation at its birth and presiding over its destiny. Or what we more prosaically might call a characteristic disposition of our culture.

In one sense, of course, everybody has a political theory, even if it is expressed only in hostility to theories. But this is a barren paradox, concealing more than it discovers. In our political life we have been like Molière’s M. Jourdain, who was astonished to discover that all his life he had been speaking prose. We have not been much interested in the “grammar” of politics; we have been more interested in the way it works rather than in the theory behind it.

12. The main purpose of the author is to

(A) Criticize the people who ask others to adopt the American philosophy
(B) Challenge the political philosophies of countries other than America
(C) Suggest an alternate way of looking at political theory of America
(D) Explain the complexities faced by the American genius
(E) Argue why a country cannot theorize its achievement

Correct Answer: (C) Suggest an alternate way of looking at political theory of America

Solution:
Step 1: Identify the main argument of the passage.
The author argues that American democracy has a unique ”genius” but lacks a fully formed ”philosophy” of its own. Instead, the author suggests that American democracy should not adopt a formal theory, but rather be viewed through its historical and cultural context.
Step 2: Analysis of options.
- (A) Criticize the people who ask others to adopt the American philosophy: The passage does not focus on criticizing others who ask to adopt the philosophy.
- (B) Challenge the political philosophies of countries other than America: This is not the central focus of the passage. The author is not targeting other countries’ philosophies.
- (C) Suggest an alternate way of looking at political theory of America: Correct. The author suggests that American democracy should be understood through its unique historical context, not by adopting a formal philosophical theory.
- (D) Explain the complexities faced by the American genius: The passage focuses more on the uniqueness of American democracy rather than explaining its complexities.
- (E) Argue why a country cannot theorize its achievement: While the author discusses the difficulty in creating a philosophy, the argument is more about suggesting a new perspective than simply arguing against theorizing achievements.
Step 3: Conclusion.
The correct answer is (C), as it best captures the author’s main argument.

Quick Tip

Pay attention to the overall message of the passage when identifying the main purpose.

13. The author sets of the word "grammar" with quotation marks in order to

(A) Emphasize its departure from the concepts of philosophy
(B) Indicate that the word is his favorite
(C) Assert that the nation is disinterested in political theory
(D) Show that people have overemphasized theory behind grammar
(E) Highlight his aversion to the word

Correct Answer: (D) Show that people have overemphasized theory behind grammar

Solution:
Step 1: Understand the context of the word "grammar."
The author uses quotation marks around the word "grammar" to emphasize that it is being used in a figurative sense to mean the way things work in politics, rather than its literal meaning. The author is critiquing how people focus too much on theory rather than the actual functioning of political processes.
Step 2: Analysis of options.
- (A) Emphasize its departure from the concepts of philosophy: While the word "grammar" is contrasted with philosophy, it does not explicitly emphasize a departure from it.
- (B) Indicate that the word is his favorite: This is not the case. The word is used critically, not because it is favored.
- (C) Assert that the nation is disinterested in political theory: This is a possible interpretation of the passage, but the use of quotation marks emphasizes how people overemphasize the theory behind grammar.
- (D) Show that people have overemphasized theory behind grammar: Correct. The author uses the quotation marks to critique how people overemphasize theoretical constructs in politics, focusing too much on "theory" instead of how things work in practice.
- (E) Highlight his aversion to the word: The author is not expressing aversion, but rather using the term critically.
Step 3: Conclusion.
The correct answer is (D), as it best captures the author's purpose in using quotation marks.

Quick Tip

Quotation marks can be used to highlight figurative language or to criticize overused concepts.

The retail price of dark chocolate is considerably higher than that of milk chocolate. However, the process by which dark chocolates are made is fairly simple and not very costly. Therefore, the price difference cannot be accounted for by the greater cost of providing dark chocolate to the chocolate-lover.
14. The argument relies on assuming which one of the following?

(A) Processing milk chocolate costs more than does processing dark chocolate.

(B) Price discrepancy between the products can usually be accounted for by such factors as supply-demand but not by the differences in production costs.
(C) There is little competition among companies that process dark chocolates.
(D) Retail chocolate-sellers do not believe that chocolate-lovers are content to pay more for dark chocolate than for milk chocolate.
(E) The ingredients used for producing dark chocolate do not cost much more before processing than the ingredients used for producing milk chocolate.

Correct Answer: (E) The ingredients used for producing dark chocolate do not cost much more before processing than the ingredients used for producing milk chocolate.

Solution:
Step 1: Understand the argument's premise.
The argument claims that the price difference between dark and milk chocolate cannot be due to the cost of ingredients and production, since the process for making dark chocolate is relatively simple and inexpensive.
Step 2: Analyze the options.
- (A) Processing milk chocolate costs more than does processing dark chocolate: This is not the assumption that supports the argument. The argument focuses on ingredient costs, not production costs.
- (B) Price discrepancy between the products can usually be accounted for by such factors as supply-demand but not by the differences in production costs: This does not address the issue of ingredient costs, which is the focus of the argument.
- (C) There is little competition among companies that process dark chocolates: The argument does not discuss competition among companies. It focuses on the cost of ingredients and production.
- (D) Retail chocolate-sellers do not believe that chocolate-lovers are content to pay more for dark chocolate than for milk chocolate: This is unrelated to the cost issue being addressed. The argument does not focus on what chocolate-lovers are willing to pay.
- (E) The ingredients used for producing dark chocolate do not cost much more before processing than the ingredients used for producing milk chocolate: Correct. The argument assumes that the cost of ingredients does not contribute significantly to the price difference, as the process is simple and inexpensive.
Step 3: Conclusion.
The correct answer is (E), as it supports the argument's conclusion that the price difference is not due to ingredient costs.

Quick Tip

Look for options that address the core assumptions the argument relies on, such as cost and production.

Clear-space produces high quality vacuum cleaners. For years, they have primarily served manufacturers of commercial cleaning equipment, and over time, this market has been decreasing. A consultant recommended that, with a minor modification, Clear-space could expand into vacuum cleaners for upright drive-belt suction technology, a rapidly expanding market. The consultant argued that this single change could reverse a ten-year decline in Clear-space's profits.

15. Which of the following would be the most useful to establish in evaluating the recommendation of the consultant?

(A) Whether other markets, such as flour mills and power stations, would offer greater opportunities for potential profits.
(B) Whether the number of upright drive-belt motors at any single work place is greater than the number of pieces of equipment requiring cleaners on a single firm.
(C) How the ambient space quality in a upright drive-belt suction technology compares to the typical space quality in an commercial cleaning set-up.
(D) Whether the competition in the upright drive-belt suction technology sector would allow for profits similar to what those in the commercial cleaning equipment sector had been.
(E) Whether countries with expanding commercial sectors would use cleaning equipment similar to cleaners currently served by Clear-space.

Correct Answer: (D) Whether the competition in the upright drive-belt suction technology sector would allow for profits similar to what those in the commercial cleaning equipment sector had been.

Solution:
Step 1: Understand the context.
Clear-space is facing a decline in its profits and the consultant suggests that it could reverse this trend by modifying its vacuum cleaners to target the growing market for upright drive-belt suction technology. The key is determining if this new market could generate profits comparable to the declining market.
Step 2: Analysis of options.
- (A) Whether other markets, such as flour mills and power stations, would offer greater opportunities for potential profits: This is not directly related to evaluating the consultant's recommendation, which focuses on the potential profitability of expanding into the upright drive-belt suction technology sector.
- (B) Whether the number of upright drive-belt motors at any single work place is greater than the number of pieces of equipment requiring cleaners on a single firm: This would give specific data about demand but doesn't directly address the question of profitability in the new market.
- (C) How the ambient space quality in an upright drive-belt suction technology compares to the typical space quality in a commercial cleaning set-up: This may be relevant to technical specifications but does not directly address profitability, which is the main concern of the consultant.
- (D) Whether the competition in the upright drive-belt suction technology sector would allow for profits similar to what those in the commercial cleaning equipment sector had been: Correct. This is the most relevant factor, as it directly compares the potential for profit in the new market to the previous market. If competition is similar, it might suggest that profits can be sustained or even improved.
- (E) Whether countries with expanding commercial sectors would use cleaning equipment similar to cleaners currently served by Clear-space: This option is less relevant because it

focuses on international demand, not the profitability within the upright drive-belt suction technology market.

Step 3: Conclusion.

The correct answer is (D) because evaluating the competition in the new sector is crucial to determining if Clear-space can successfully enter and profit from this growing market.

Quick Tip

When evaluating business recommendations, focus on factors like competition, market demand, and profitability rather than peripheral issues.

Cary is, at best, able to write poems of average quality. The most forceful pieces of evidence for this are those few of the numerous poems submitted by Cary that are superior, since Cary, who is incapable of writing a poem that is better than average, obviously must have plagiarized the superior ones.

16. The argument is most vulnerable to criticism on which of the following grounds?

(A) It simply doesn't take into account the existence of potential counter-premise.
(B) It generalizes from one of its kind occurrences.
(C) It presumes what it seeks to establish.
(D) It depends on the judgment of specialists in a matter where their specialty is irrelevant.
(E) It infers limits on ability from a few standalone lapses in performance.

Correct Answer: (E) It infers limits on ability from a few standalone lapses in performance.

Solution:

Step 1: Analyze the argument.

The argument suggests that Cary's ability to write quality poems is limited because the few poems that are superior must have been plagiarized. This is an argument based on a few isolated instances to infer a general conclusion about Cary's abilities.

Step 2: Analysis of options.

- (A) It simply doesn't take into account the existence of potential counter-premise: The argument does not ignore counter-premises, but rather generalizes from specific instances.
- (B) It generalizes from one of its kind occurrences: This is a close option, but the argument generalizes from a few instances, not just one.
- (C) It presumes what it seeks to establish: This is not accurate because the argument does not presuppose the conclusion but rather makes an inference based on observed behavior.
- (D) It depends on the judgment of specialists in a matter where their specialty is irrelevant: This does not apply because the argument does not rely on experts or their judgments.
- (E) It infers limits on ability from a few standalone lapses in performance: Correct. The argument makes an unwarranted conclusion based on a few instances of success, assuming they must be plagiarized.

Step 3: Conclusion.

The correct answer is (E), as it most accurately describes the flaw in the reasoning of the argument.

Quick Tip

Be cautious of arguments that draw broad conclusions from isolated examples or small amounts of evidence.

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17. Unlike the opinion held by many of his peers that lasers were relatively simple, Arthur Ashkin adhered to his own more complicated ideas about how lasers might operate, and in 2018, at the age of 96, was awarded a Nobel Prize for his invention of 'optical tweezers'.

(A) Unlike the opinion held by many of his peers that lasers were relatively simple
(B) Unlike the opinion held by many of his peers that lasers were relatively simple
(C) Compared to many of his peers' opinions that lasers were relatively simple
(D) Even though many of his peers were convinced that lasers were relatively simple
(E) Even with many of his peers convinced of lasers being relatively simple

Correct Answer: (D) Even though many of his peers were convinced that lasers were relatively simple.

Solution:
Step 1: Analyze the sentence.
The sentence contrasts Ashkin's views with those of his peers. The key structure needs to express the contrast between Ashkin's ideas and the simpler views of his peers.
Step 2: Analysis of options.
- (A) Unlike the opinion held by many of his peers that lasers were relatively simple: This option is incomplete because it lacks the full comparison to Ashkin's more complex ideas.
- (B) Unlike the opinion held by many of his peers that lasers were relatively simple: Same as (A), lacking the full structure of contrast.
- (C) Compared to many of his peers' opinions that lasers were relatively simple: This comparison is incomplete and awkward. The sentence needs a more direct contrast.
- (D) Even though many of his peers were convinced that lasers were relatively simple: Correct. This option properly introduces the contrast using "even though," making it clear that Ashkin's views were different despite his peers' conviction.
- (E) Even with many of his peers convinced of lasers being relatively simple: This option is awkward and does not provide the smooth contrast needed for the sentence.
Step 3: Conclusion.
The correct answer is (D), as it properly conveys the contrast between Ashkin's complex ideas and those of his peers.

Quick Tip

Look for transition words like "even though" to indicate contrast between differing views.

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18. Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and had covered their expenses, but also cause minimum wage employees to quit their jobs.

(A) Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and had covered their expenses, but also
(B) Unemployment benefits in the United States not only supported recession struck individuals, created opportunities for volunteerism, and covered the expenses of the unemployed, but also
(C) Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and cover the expenses of the unemployed, but also
(D) Unemployment benefits in the United States supported not only recession struck individuals, create opportunities for volunteerism, and cover their expenses, but also they
(E) Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and cover their expenses, at the same time

Correct Answer: (C) Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and cover the expenses of the unemployed, but also

Solution:
Step 1: Analyze the sentence structure.
The sentence contains a list of actions supported by unemployment benefits, followed by a final action that contrasts with the others. The conjunction "but also" should be used properly after the list.
Step 2: Analysis of options.
- (A) Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and had covered their expenses, but also: "Had covered" is an incorrect tense usage. It should be "cover" to maintain parallel structure.
- (B) Unemployment benefits in the United States not only supported recession struck individuals, created opportunities for volunteerism, and covered the expenses of the unemployed, but also: This option maintains parallel structure correctly but changes the meaning by suggesting a different phrasing ("not only... but also").
- (C) Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and cover the expenses of the unemployed, but also: Correct. This option uses the correct parallel structure and maintains clarity.
- (D) Unemployment benefits in the United States supported not only recession struck individuals, create opportunities for volunteerism, and cover their expenses, but also they: The structure is awkward and lacks clarity in phrasing.
- (E) Unemployment benefits in the United States did not only support recession struck individuals, create opportunities for volunteerism, and cover their expenses, at the same time: "At the same time" is unnecessary and disrupts the flow.
Step 3: Conclusion.
The correct answer is (C), as it uses the appropriate parallel structure and clear expression.

Quick Tip

Ensure that all items in a list are in parallel structure when using conjunctions like ”not only... but also.”

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19. In the last century, the Indian population has grown faster than China, Brazil, or Russia, with the economy having remained well below that of the other three countries.

(A) China, Brazil, or Russia, with the economy having remained
(B) has those of China, Brazil, or Russia, and the economy remaining
(C) the Chinese, the Brazilian, or the Russian economy having remained
(D) Compared to many of his peers' opinions that lasers were relatively simple
(E) Even with many of his peers convinced of lasers being relatively simple

Correct Answer: (A) China, Brazil, or Russia, with the economy having remained

Solution:
Step 1: Analyze the sentence.
The sentence compares India's population growth to that of other countries while also discussing the relative economic standing. The structure must present the comparison logically.
Step 2: Analysis of options.
- (A) China, Brazil, or Russia, with the economy having remained: Correct. This option correctly links India's population growth and economic comparison with the other countries.
- (B) has those of China, Brazil, or Russia, and the economy remaining: This option is awkward and does not maintain the intended meaning of the comparison.
- (C) the Chinese, the Brazilian, or the Russian economy having remained: This structure creates unnecessary complexity and is grammatically incorrect.
- (D) Compared to many of his peers' opinions that lasers were relatively simple: This does not relate to the intended comparison of population growth and economic standing.
- (E) Even with many of his peers convinced of lasers being relatively simple: This is unrelated to the sentence's meaning.
Step 3: Conclusion.
The correct answer is (A), as it properly conveys the intended comparison and maintains clarity in the sentence.

Quick Tip

When comparing countries or items, ensure that the structures are parallel and logical.

Several industries have recently switched at least partly from older technologies powered by non-renewable energy sources to new technology powered by renewable energy sources. It is thus evident that less non renewable energy sources is being used as a result of the operations of these industries than would have been used if these industries had retained their older technologies.

20. Which of the following, if true, most strengthen the argument above?

(A) A good number of industries that have switched at least partly to new technologies have increased their output.
(B) Less energy, generated from non-renewable energy source, was used to manufacture the machinery employed in the new technologies than was originally used to manufacture the machinery employed in the older technologies.
(C) More energy, generated from renewable energy source, is used to by those industries that have switched at least partly to the new technologies than by those industries that have not switched.
(D) Some of the industries that have switched at least partly to the new technologies still primarily use technologies that are powered by non-renewable energy source.
(E) The amount of energy, generated from non-renewable energy source, used to generate the electricity needed to power the new technologies is less than amount that would have been used to power the older technologies.

Correct Answer: (E) The amount of energy, generated from non-renewable energy source, used to generate the electricity needed to power the new technologies is less than amount that would have been used to power the older technologies.

Solution:
Step 1: Analyze the argument.
The argument suggests that less non-renewable energy is being used due to industries switching to new technologies powered by renewable energy. To strengthen the argument, we need to provide evidence that shows how much less non-renewable energy is being used in comparison to the older technologies.
Step 2: Analysis of options.
- (A) A good number of industries that have switched at least partly to new technologies have increased their output: While this shows a positive effect of switching to new technologies, it doesn't directly address the energy usage comparison.
- (B) Less energy, generated from non-renewable energy source, was used to manufacture the machinery employed in the new technologies than was originally used to manufacture the machinery employed in the older technologies: This may be relevant but focuses on the machinery production aspect, not on the overall energy consumption after the technology switch.
- (C) More energy, generated from renewable energy source, is used by those industries that have switched at least partly to the new technologies than by those industries that have not switched: This addresses the shift to renewable energy but doesn't show a direct reduction in non-renewable energy usage, which is the core of the argument.
- (D) Some of the industries that have switched at least partly to the new technologies still primarily use technologies that are powered by non-renewable energy source: This weakens the argument as it suggests that non-renewable energy is still in use, which contradicts the idea of reduced non-renewable energy usage.
- (E) The amount of energy, generated from non-renewable energy source, used to generate the electricity needed to power the new technologies is less than the amount that would have been used to power the older technologies: Correct. This directly supports the argument by

confirming that less non-renewable energy is being used to power the new technologies than would have been used for the old technologies.

Step 3: Conclusion.

The correct answer is (E), as it provides direct evidence supporting the claim of reduced non-renewable energy use.

> **Quick Tip**
>
> Look for options that directly address the energy usage comparison, especially when the argument is about a reduction in non-renewable energy consumption.

Given an experiment set-up, each participant was allowed to choose between a simple task and a complex task and was told that another person would do the other task. Each person could also choose to have a computer assign the two tasks randomly. Most of the people had chosen the simple task for themselves and when questioned later they said that they had acted fairly. But when the scenario was described to another group of people, almost all said choosing the simple task would be unfair. This proves that majority of the people apply weaker moral standards to themselves than to others.

21. Which of the following is an assumption required by this argument?

(A) At least some participants who said they had acted fairly in choosing the familiar task would have said that it was unfair for someone else to do so.
(B) The most moral choice for the people would have been to have the computer assign the two tasks randomly.
(C) There were at least some persons who were assigned to do the unfamiliar task and felt that the assignment was unfair.
(D) On average, the people to whom the scenario was described were more accurate in their moral judgments than the other volunteers were.
(E) At least some people given the choice between assigning the tasks themselves and having the computer assign them felt that they had made the only fair choice available to them.

Correct Answer: (E) At least some people given the choice between assigning the tasks themselves and having the computer assign them felt that they had made the only fair choice available to them.

Solution:

Step 1: Understand the argument.

The argument suggests that most people feel that choosing the simple task for themselves is unfair when the scenario is described to others. This implies that people apply weaker moral standards to themselves than to others. The assumption needed here is that some people felt they had no other option but to choose the simple task, making the choice seem fair to them.

Step 2: Analysis of options.

- (A) At least some participants who said they had acted fairly in choosing the familiar task would have said that it was unfair for someone else to do so: This is not necessary for the argument, as it focuses on the fairness of the task assignment rather than the people's justification of their own choice.

- (B) The most moral choice for the people would have been to have the computer assign the two tasks randomly: This does not directly relate to the assumption needed for the argument, which is focused on people's perceptions of fairness when they are given the option to choose.
- (C) There were at least some persons who were assigned to do the unfamiliar task and felt that the assignment was unfair: This is a valid observation, but it doesn't directly support the assumption that people feel they had made the only fair choice available to them.
- (D) On average, the people to whom the scenario was described were more accurate in their moral judgments than the other volunteers were: This is irrelevant to the core assumption, which focuses on people's moral choices in the given scenario.
- (E) At least some people given the choice between assigning the tasks themselves and having the computer assign them felt that they had made the only fair choice available to them: Correct. This assumption is necessary to justify why people felt that choosing the simple task for themselves was fair, even though they later viewed it as unfair when applied to others.

Step 3: Conclusion.
The correct answer is (E), as it provides the essential assumption that allows the argument to hold: people felt their choice was the fairest possible one given the scenario.

Quick Tip

In arguments that involve fairness and morality, look for the assumptions that explain why people might justify their choices in a way that conflicts with how they perceive others' choices.

Debater: The average amount of overtime per month worked by an employee in the designing division of the Power Corporation is 15 hours. Most employees of the Power Corporation work in the designing division. Additionally, the average amount of overtime worked by any employee per month in the company generally does not fluctuate much from month to month. Therefore, each month, most employees of the Power Corporation almost certainly work at least some overtime.

22. On which of these grounds is the debater's argument most vulnerable to criticism?

(A) It takes for granted that the designing division is a typical division of the corporation with regard to the average amount of overtime its employees work each month.
(B) It takes for granted that if a certain average amount of overtime is worked each month by each employee of the Power Corporation, then approximately the same amount of overtime must be worked each month by each employee of the designing division.
(C) It confuses a claim from which the argument's conclusion about the Power Corporation would necessarily follow with a claim that would follow from the argument's conclusion only with a high degree of probability.
(D) It overlooks the possibility that even, on average, a certain amount of overtime is worked by the members of some group, many members of that group may work no overtime at all.
(E) It overlooks the possibility that even, on average, a certain amount of overtime is worked by the members of some group, and many members of the corporation work some overtime each month, but some employees may work none at all.

Correct Answer: (D) It overlooks the possibility that even, on average, a certain amount of overtime is worked by the members of some group, many members of that group may work no overtime at all.

Solution:
Step 1: Analyze the debater's argument.
The debater argues that since the average overtime worked by employees in the designing division is 15 hours, most employees of the Power Corporation work at least some overtime. The argument assumes that the average overtime worked each month is indicative of all employees working overtime.
Step 2: Identify the flaw.
The flaw in the argument is that it assumes that the average overtime worked by the employees is applicable to all employees. It overlooks the fact that while the average overtime might be 15 hours, some employees may work no overtime at all, and others may work much more. This is crucial for evaluating the debater's argument.
Step 3: Analysis of options.
- (A) It takes for granted that the designing division is a typical division of the corporation with regard to the average amount of overtime its employees work each month: This is not the primary flaw in the argument; it is more concerned with the generalization of overtime.
- (B) It takes for granted that if a certain average amount of overtime is worked each month by each employee of the Power Corporation, then approximately the same amount of overtime must be worked each month by each employee of the designing division: This is an assumption, but it does not directly address the core flaw.
- (C) It confuses a claim from which the argument's conclusion about the Power Corporation would necessarily follow with a claim that would follow from the argument's conclusion only with a high degree of probability: This is not the most relevant flaw to the argument about the generalization of overtime work.
- (D) It overlooks the possibility that even, on average, a certain amount of overtime is worked by the members of some group, many members of that group may work no overtime at all: Correct. This directly addresses the issue of generalization and the fallacy of assuming that the average applies to all individuals.
- (E) It overlooks the possibility that even, on average, a certain amount of overtime is worked by the members of some group, and many members of the corporation work some overtime each month, but some employees may work none at all: This is similar to (D) but less precise in addressing the flaw about how the argument generalizes the average.
Step 4: Conclusion.
The correct answer is (D), as it highlights the fundamental flaw in the debater's argument, which assumes that the average overtime worked applies to all individuals.

Quick Tip

When evaluating an argument based on averages, consider the possibility of individual variations that may not be represented by the average.

Building transistors today is done with lithography, which is a "top-down" process that uses

patterning to create the complex layers that make up the transistor structure. It's a bit like exposing a negative on photographic paper to get the pattern you want and then using this pattern as a template to place each material—metal, insulator or semiconductor—in exactly the right location. This process has worked successfully since the 1950s. But as we get to ever-smaller dimensions, new approaches to building nano-scale devices will be required. At IBM's T.J. Watson Research Center, we use a technique called self-assembly to grow and directly control nanostructures that could one day form parts of integrated circuits.
Self-assembly looks at a "bottom-up" approach that builds nanostructures in a way that is dictated by physics rather than by an imposed pattern. In some ways it's like farming, in that you plant seeds to grow a crop, and then support the growth with the right conditions to get the result you want.
Exploring self-assembly doesn't mean we are ready to throw away today's approach; instead, we want to use top-down strategies that we have already learned over many years, and combine them with new tricks that use self-assembly. Think of it as water splashing onto a pane of glass. It spontaneously forms little hemispheres because of surface tension. But the positions and sizes of the droplets are random. Now imagine there is a scratch on the glass. Water droplets form on the scratch, because it is a good, low energy place for the water molecules to stick. We have now combined self-assembly (make a hemispherical droplet on this surface) with an imposed pattern (make a droplet on this part of the surface by using carefully placed scratches.) The result is that we can build more complicated patterns. Flexible, customized patterns—like this water example, but on the nano-scale—help us build integrated circuits. The more precisely we can direct this self-assembly, the more versatility we can achieve.
23. What does the passage do as a whole?

(A) Explains why self-assembly is the best approach to make integrated circuits.
(B) Explains how the "top-bottom" approach is better than the "bottom-up approach."
(C) Shows how the "bottom-up" and the "top-bottom approach" can both complement and hinder the development of nano- scaling techniques.
(D) Discusses how "top-bottom approach" has been discarded because of the new approach.
(E) Reasons that future necessitates an innovative approach.

Correct Answer: (C) Shows how the "bottom-up" and the "top-bottom approach" can both complement and hinder the development of nano- scaling techniques.

Solution:
Step 1: Analyze the main theme of the passage.
The passage describes the benefits and potential of both the top-down (lithography) and bottom-up (self-assembly) approaches to creating integrated circuits. It highlights how these methods can complement each other and support the development of nano-scale devices.
Step 2: Analysis of options.
- (A) Explains why self-assembly is the best approach to make integrated circuits: The passage does not argue that self-assembly is the best approach, but rather that both approaches have their merits and can complement each other.
- (B) Explains how the "top-bottom" approach is better than the "bottom-up approach": The passage does not say that one is better than the other; it emphasizes combining both approaches.

- (C) Shows how the “bottom-up” and the “top-bottom approach” can both complement and hinder the development of nano-scaling techniques: Correct. The passage discusses both approaches, how they can work together, and the challenges and advantages of each.
- (D) Discusses how “top-bottom approach” has been discarded because of the new approach: The passage does not discard the top-down approach but suggests combining it with self-assembly.
- (E) Reasons that future necessitates an innovative approach: The passage does not focus on the future necessity but on current strategies.

Step 3: Conclusion.
The correct answer is (C), as it best captures the main focus of the passage, which is about how both approaches can complement each other.

Quick Tip

Look for options that encompass the overall argument in the passage rather than focusing on a single method.

---

24. According to the author, the primary difficulty in using top-bottom approach is that

(A) The new approach is easier to work with.
(B) The task of working on ever-smaller dimensions is way too complicated for the approach.
(C) This process has worked since 1950s till now only.
(D) It is not future ready.
(E) It is as tedious a task as exposing a negative on photographic paper.

Correct Answer: (B) The task of working on ever-smaller dimensions is way too complicated for the approach.

Solution:
Step 1: Identify the primary challenge discussed in the passage.
The author discusses how as technology advances and the need for smaller devices increases, the traditional top-down approach becomes increasingly difficult to use for nano-scale devices.
Step 2: Analysis of options.
- (A) The new approach is easier to work with: This is incorrect because the new approach is not described as easier, but rather as a complementary method to the top-down approach.
- (B) The task of working on ever-smaller dimensions is way too complicated for the approach: Correct. The passage discusses how as the dimensions get smaller, the top-down approach becomes less effective.
- (C) This process has worked since 1950s till now only: The passage mentions the long use of top-down processes, but it doesn’t say this is the primary challenge.
- (D) It is not future ready: The passage does not claim that the top-down approach is not future ready, but rather that it needs to be supplemented by new techniques.
- (E) It is as tedious a task as exposing a negative on photographic paper: This is used as an analogy for the complexity of the task but is not the primary difficulty identified.

Step 3: Conclusion.

The correct answer is (B), as it directly addresses the primary challenge described in the passage.

> **Quick Tip**
>
> Look for challenges related to limitations in technology, especially when working with smaller dimensions or more complex requirements.

---

25. Why does the author use the example of water splashing on a pane of glass?

(A) Explain how integrated circuits can be made only by self-assembly.
(B) To provide an analogy for the combined method.
(C) To illustrate bottom-up approach.
(D) To raise questions about bottom-up approach.

Correct Answer: (B) To provide an analogy for the combined method.

Solution:
Step 1: Understand the analogy.
The example of water splashing on a pane of glass is used to illustrate the idea of combining self-assembly (bottom-up) with an imposed pattern (top-down), showing how both methods can work together to form more controlled, complex patterns.
Step 2: Analysis of options.
- (A) Explain how integrated circuits can be made only by self-assembly: This is not correct because the passage discusses a combination of self-assembly and top-down approaches.
- (B) To provide an analogy for the combined method: Correct. The water analogy demonstrates how self-assembly and top-down strategies can work together.
- (C) To illustrate bottom-up approach: While the water example relates to self-assembly, the main point is how it combines with the top-down approach.
- (D) To raise questions about bottom-up approach: The passage does not question the bottom-up approach but rather highlights how it can be integrated with the top-down approach.
Step 3: Conclusion.
The correct answer is (B), as the water analogy is used to explain how both approaches can be combined to achieve better results.

> **Quick Tip**
>
> Look for analogies in the text that help illustrate how two different methods or processes can work together effectively.

---

26. Which of the following best expresses the function of the first paragraph in relation to the passage as a whole?

(A) To establish the parameters of an ensuing debate.
(B) To identify problems in one of the processes, which are then explored in greater details.
(C) To provide a backdrop for a discussion of a modern day approach.
(D) To discuss an existing prototype that the author admires.
(E) To introduce opposing viewpoints, which are then evaluated.

Correct Answer: (C) To provide a backdrop for a discussion of a modern day approach.

Solution:
Step 1: Understand the role of the first paragraph.
The first paragraph introduces the traditional top-down method used for building integrated circuits, setting up the context for the discussion about new approaches such as self-assembly (bottom-up) and how they complement the existing methods.
Step 2: Analysis of options.
- (A) To establish the parameters of an ensuing debate: The first paragraph does not set up a debate but introduces the existing method.
- (B) To identify problems in one of the processes, which are then explored in greater details: The first paragraph does not identify a problem but provides an overview of the top-down process.
- (C) To provide a backdrop for a discussion of a modern day approach: Correct. The first paragraph sets the stage for the discussion of the modern day approach (self-assembly).
- (D) To discuss an existing prototype that the author admires: The paragraph does not focus on a specific prototype but on the general top-down process.
- (E) To introduce opposing viewpoints, which are then evaluated: There are no opposing viewpoints introduced in the first paragraph.
Step 3: Conclusion.
The correct answer is (C), as it accurately describes the function of the first paragraph in introducing the current method for building integrated circuits.

> **Quick Tip**
>
> The introductory paragraph typically sets the stage for the main discussion or argument in the passage.

---

27. Which of the following titles best summarizes the passage as a whole?

(A) A look at the history of nanostructures
(B) Pointing out limited usefulness of the "top-down" process
(C) Detailed study of transistors
(D) At the threshold of new approach
(E) How top-bottom approach works

Correct Answer: (D) At the threshold of new approach

Solution:
Step 1: Understand the passage's focus.

The passage describes how traditional top-down methods are being supplemented by self-assembly (bottom-up) approaches in nanotechnology. The central theme is about how new approaches are at the threshold of replacing or complementing older methods.

Step 2: Analysis of options.

- (A) A look at the history of nanostructures: The passage focuses more on the present and future of nanotechnology rather than its history.
- (B) Pointing out limited usefulness of the "top-down" process: This is not the primary focus. The passage discusses how both approaches are useful and can complement each other.
- (C) Detailed study of transistors: While transistors are mentioned, the passage is more about approaches to building nano-scale devices than specific studies on transistors.
- (D) At the threshold of new approach: Correct. This best captures the passage's theme of combining traditional and new methods in nanotechnology.
- (E) How top-bottom approach works: This is a limited perspective, focusing only on the top-down approach, rather than the main message of combining methods.

Step 3: Conclusion.

The correct answer is (D) because it best reflects the passage's theme of adopting new approaches in nanotechnology.

> **Quick Tip**
>
> When summarizing a passage, focus on its overall theme or conclusion rather than specific details or historical contexts.

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28. The 22-year-old choreographer and actor performed his most recent work all over Europe, Asia, and North America last year, winning prestigious awards in both France as well as Japan for his achievement at so young an age, and he is hoping to continue acting now that he has returned to India.

(A) winning prestigious awards in both France as well as Japan for his achievement at so young an age, and he is hoping
(B) winning prestigious awards in both France as well as Japan for his achievement at such a young age, hoping
(C) winning prestigious awards both in France and Japan for his achievement at such a young age, and hoping
(D) winning prestigious awards both in France as well as Japan for his achievement at so young an age, and hoping
(E) having won prestigious awards both in France as well as Japan for his achievement at so young an age, and he hopes

Correct Answer: (B) winning prestigious awards in both France as well as Japan for his achievement at such a young age, hoping

Solution:

Step 1: Analyze the sentence.

The sentence describes the awards and achievements of the choreographer and actor. The phrase "hoping" must flow correctly with the previous part of the sentence.

Step 2: Analysis of options.
- (A) winning prestigious awards in both France as well as Japan for his achievement at so young an age, and he is hoping: This option is redundant with the use of "he is hoping."
- (B) winning prestigious awards in both France as well as Japan for his achievement at such a young age, hoping: Correct. This option is concise and grammatically correct, matching the style of the sentence.
- (C) winning prestigious awards both in France and Japan for his achievement at such a young age, and hoping: This option is missing clarity about what he is hoping for.
- (D) winning prestigious awards both in France as well as Japan for his achievement at so young an age, and hoping: This has a minor issue with the structure of the phrase "as well as."
- (E) having won prestigious awards both in France as well as Japan for his achievement at so young an age, and he hopes: The past perfect tense "having won" is unnecessary here.
Step 3: Conclusion.
The correct answer is (B) because it is the clearest and most grammatically correct construction.

Quick Tip

When describing actions in the past with hopes for the future, use consistent and clear verb tenses.

---

29. Rajasthan village crafts, as with other cultures, have developed through the principle that form follows function and incorporate readily available materials fashioned using traditional skills.

(A) as with
(B) as those of
(C) as they have in
(D) like in
(E) like those of

Correct Answer: (A) as with

Solution:
Step 1: Analyze the sentence structure.
The phrase "as with other cultures" correctly compares Rajasthan village crafts to other cultures' crafts, indicating that both have developed similarly.
Step 2: Analysis of options.
- (A) as with: Correct. This is the simplest and most accurate way to make the comparison.
- (B) as those of: This is grammatically incorrect in this context.
- (C) as they have in: This phrase introduces unnecessary complexity.
- (D) like in: This is awkward and less natural than "as with."
- (E) like those of: This is not a proper comparison structure.
Step 3: Conclusion.

The correct answer is (A) because it provides a smooth and accurate comparison.

Quick Tip

Use "as with" for smooth comparisons between similar ideas or examples.

---

30. Almost like clones in their similarity to one another, the penguin species' homogeneity makes them especially vulnerable to disease.

(A) the penguin species' homogeneity makes them especially vulnerable to disease
(B) the penguin species is especially vulnerable to disease because of its homogeneity
(C) the homogeneity of the penguin species makes it especially vulnerable to disease
(D) homogeneity makes members of the penguin species especially vulnerable to disease
(E) members of the penguin species are especially vulnerable to disease because of their homogeneity.

Correct Answer: (C) the homogeneity of the penguin species makes it especially vulnerable to disease

Solution:
Step 1: Analyze the sentence.
The sentence discusses how the uniformity of the penguin species makes them vulnerable to disease.
Step 2: Analysis of options.
- (A) the penguin species' homogeneity makes them especially vulnerable to disease: This is almost correct, but it lacks clarity in conveying how homogeneity affects vulnerability.
- (B) the penguin species is especially vulnerable to disease because of its homogeneity: This is a correct sentence but is less precise than (C).
- (C) the homogeneity of the penguin species makes it especially vulnerable to disease: Correct. This is the clearest and most grammatically accurate phrasing.
- (D) homogeneity makes members of the penguin species especially vulnerable to disease: This is awkward and unclear in terms of phrasing.
- (E) members of the penguin species are especially vulnerable to disease because of their homogeneity: This is accurate but less clear than option (C).
Step 3: Conclusion.
The correct answer is (C), as it is the most precise and clear expression of the idea.

Quick Tip

Use clear and direct phrasing to express cause-and-effect relationships in scientific or factual writing.

Between 1960 and 1980 the seal fish population of the Siargao Islands declined precipitously. There were no signs of disease or malnutrition, so there was probably an increase in the number of seal fish being eaten by predators. Whales will eat seal fish when otters, their normal prey, are unavailable, and the Siargao Islands otter population declined dramatically in the 1960s. Therefore, whales were most likely the immediate cause of the seal fish population decline.

31. Which of the following, if true, most strengthens the argument?

(A) The population of sea urchins, the main food of seal fishes, has increased since the seal fish population declined.
(B) Otters do not eat seal fishes, nor do they compete with seal fishes for food.
(C) Most of the surviving seal fishes live in a bay that is inaccessible to whales.
(D) The population of whales in the Siargao Islands has declined since the 1960s.
(E) An increase in commercial fishing near the Siargao Islands in the 1960s caused a slight decline in the population of the fish that seals use for food.

Correct Answer: (B) Otters do not eat seal fishes, nor do they compete with seal fishes for food.

Solution:
Step 1: Understand the argument.
The argument suggests that whales were the immediate cause of the decline in the seal fish population because whales, when otters are unavailable, will eat seal fish. To strengthen this argument, we need to show that otters' absence (and the whales' increased predation) is the likely cause of the population decline, and that otters do not contribute to the seal fish population's decline by eating them.
Step 2: Analysis of options.
- (A) The population of sea urchins, the main food of seal fishes, has increased since the seal fish population declined: This doesn't directly support the argument, as it talks about a different food source (sea urchins) rather than the effect of whales on the seal fish population.
- (B) Otters do not eat seal fishes, nor do they compete with seal fishes for food: Correct. This option strengthens the argument because it supports the idea that whales are the primary predators of seal fish when otters are unavailable, eliminating the possibility that otters are contributing to the seal fish population decline.
- (C) Most of the surviving seal fishes live in a bay that is inaccessible to whales: While this could be true, it doesn't address the predation of whales and otters in the main habitat, which is essential for strengthening the argument.
- (D) The population of whales in the Siargao Islands has declined since the 1960s: This weakens the argument because it suggests that fewer whales are present, which would make it less likely that they are the cause of the seal fish population decline.
- (E) An increase in commercial fishing near the Siargao Islands in the 1960s caused a slight decline in the population of the fish that seals use for food: This introduces another factor (commercial fishing) but doesn't strengthen the argument that whales, not commercial fishing, were the immediate cause of the seal fish population decline.
Step 3: Conclusion.
The correct answer is (B), as it directly strengthens the argument by clarifying that otters are not responsible for the decline of the seal fish population, which supports the idea that whales were the primary cause.

Quick Tip

Look for options that directly support the main cause or explanation in the argument, in this case, the role of whales.

Deconstructive criticism of literature demands a very unique structural analysis, a demand so restrictive due to its all- inclusive approach that it stifles any possibility of it being successful. This is specifically where the critic faces a problem: the study must recognize not only what is present in the passage but also what is absent. To achieve this, the critic must lay aside one's social conditioning and not be blinded to certain qualities of work, thereby prevent an adequate understanding that deconstruction demands. As human behavior is but a product of its circumstances, to be objective to all that is contained in a literary work becomes a utopian idea, something that we may but only dream of achieving.
32. According to the author, a deconstructive study would be successful if it

(A) studies the artwork in reference to a fixed set of ideas and values
(B) Invests more time in observation of art work
(C) Is dispassionate about the literary work
(D) Takes into account the preferences of the author
(E) Focuses on the peculiar structure of the literary work

Correct Answer: (E) Focuses on the peculiar structure of the literary work

Solution:
Step 1: Understand the main point of the passage.
The passage emphasizes the need for a critic to approach a literary work with objectivity and an awareness of its structure while laying aside their own biases and conditioning. The deconstructive study must analyze the peculiar structure of the work to understand what is present and absent.
Step 2: Analysis of options.
- (A) studies the artwork in reference to a fixed set of ideas and values: The passage rejects the idea of fixed perspectives in deconstructive criticism.
- (B) Invests more time in observation of art work: This option does not align with the passage's focus on structural analysis.
- (C) Is dispassionate about the literary work: While being dispassionate is implied, the passage highlights structural analysis over emotional detachment.
- (D) Takes into account the preferences of the author: The passage doesn't emphasize the author's preferences but rather the structural qualities of the work.
- (E) Focuses on the peculiar structure of the literary work: Correct. This aligns with the central idea of the passage, which stresses the importance of focusing on the structure to understand the work fully.
Step 3: Conclusion.
The correct answer is (E), as it best reflects the passage's view on what makes a deconstructive study successful.

Quick Tip

Look for the core focus in the passage. In this case, it's about analyzing the structure of the work.

---

33. Which of the option below could describe tone of the author towards a deconstructive study?

(A) Peculiar but interesting
(B) Unbiased and systematic
(C) Challenging but practical
(D) Impractical and problematic
(E) Unnecessary and pointless

Correct Answer: (D) Impractical and problematic

Solution:
Step 1: Understand the tone in the passage.
The tone of the passage is critical and suggests that the deconstructive study is very difficult to carry out. The author hints that it is an ideal that is almost impossible to achieve due to human social conditioning.
Step 2: Analysis of options.
- (A) Peculiar but interesting: While the passage mentions a unique approach, the tone is not purely "interesting" but rather critical of the practicality of achieving a fully objective deconstructive study.
- (B) Unbiased and systematic: This is an inaccurate description, as the passage critiques the challenge of being truly unbiased.
- (C) Challenging but practical: The passage does acknowledge challenges but does not suggest that it is practical to achieve.
- (D) Impractical and problematic: Correct. The passage reflects the impracticality of achieving the ideal deconstructive study and highlights the problems that come with the challenge of being fully objective.
- (E) Unnecessary and pointless: While the passage is critical, it doesn't go as far as to call the study pointless. The challenge is emphasized, but the pursuit is still seen as meaningful.
Step 3: Conclusion.
The correct answer is (D), as it accurately reflects the critical and somewhat pessimistic tone of the author regarding deconstructive criticism.

Quick Tip

Pay attention to the tone described in the passage. In this case, it's critical and reflects the difficulties of achieving the ideal deconstructive study.

---

34. With privacy concerns, such as private entities accessing, using and possibly misusing biometric data plaguing the ever connected digitalized world, the makers of privacy law seems to be in a dilemma as they often have no existing framework to define the scope of sensitive personal data, like political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see.

(A) The makers of privacy law seems to be in a dilemma as they often have no existing framework to define the scope of sensitive personal data, like political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see.
(B) Lawmakers seem to be in a dilemma as it often has no existing framework to define the scope of sensitive personal data, such as political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see.
(C) Over political and religious views, ethnicity and biometric data, and, what should be available in the public domain for one and all to see, the makers of privacy law are in a dilemma as they often have no existing framework to define the scope of sensitive personal data.
(D) Over political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see, the makers of privacy law are in a dilemma as they often have no existing framework to define the scope of sensitive personal data.
(E) Lawmakers are in a dilemma as they often have no existing framework to define the scope of sensitive personal data, such as political and religious views, ethnicity and biometric data, and, what should be available in the public domain for one and all to see.

Correct Answer: (B) Lawmakers seem to be in a dilemma as it often has no existing framework to define the scope of sensitive personal data, such as political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see.

Solution:
Step 1: Understand the sentence structure.
The sentence describes the dilemma faced by those creating privacy laws, and the phrasing must be clear and grammatically correct. We need to avoid unnecessary repetition or misplaced modifiers.
Step 2: Analysis of options.
- (A) The makers of privacy law seems to be in a dilemma as they often have no existing framework to define the scope of sensitive personal data, like political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see: The phrase "makers of privacy law seems" is grammatically incorrect; it should be "makers of privacy law seem."
- (B) Lawmakers seem to be in a dilemma as it often has no existing framework to define the scope of sensitive personal data, such as political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see: Correct. This option is grammatically correct and clear.
- (C) Over political and religious views, ethnicity and biometric data, and, what should be available in the public domain for one and all to see, the makers of privacy law are in a

dilemma as they often have no existing framework to define the scope of sensitive personal data: This option is awkward and convoluted. The sentence is not clear or fluid.
- (D) Over political and religious views, ethnicity and biometric data, also, what should be available in the public domain for one and all to see, the makers of privacy law are in a dilemma as they often have no existing framework to define the scope of sensitive personal data: This option suffers from awkward phrasing and lack of clarity.
- (E) Lawmakers are in a dilemma as they often have no existing framework to define the scope of sensitive personal data, such as political and religious views, ethnicity and biometric data, and, what should be available in the public domain for one and all to see: This is similar to (B) but is not as fluid.

Step 3: Conclusion.
The correct answer is (B) because it is clear, grammatically correct, and accurately reflects the meaning.

Quick Tip

Ensure that sentence structure flows logically and is grammatically correct, especially when dealing with complex ideas.

---

35. In May of 1832, The Opening of Waterloo Bridge, John Constable's view of Waterloo Bridge over the Thames sold for £18.5 million and it was the third highest price ever paid for a painting at auction.

(A) Thames sold for £18.5 million and it was
(B) Thames, which sold for £18.5 million, was
(C) Thames, was sold for £18.5 million
(D) Thames sold for £18.5 million, being
(E) Thames, sold for £18.5 million, and was

Correct Answer: (B) Thames, which sold for £18.5 million, was

Solution:
Step 1: Understand the sentence structure.
The sentence provides additional information about the sale of the painting and must be clear and grammatically correct. The correct choice should smoothly integrate this information.
Step 2: Analysis of options.
- (A) Thames sold for £18.5 million and it was: This sentence is missing important context and is grammatically incorrect.
- (B) Thames, which sold for £18.5 million, was: Correct. This sentence provides clear and accurate information with proper use of commas and is grammatically sound.
- (C) Thames, was sold for £18.5 million: This option is incorrect due to awkward phrasing and punctuation.
- (D) Thames sold for £18.5 million, being: "Being" creates confusion and disrupts the sentence's clarity.
- (E) Thames, sold for £18.5 million, and was: This option contains unnecessary punctuation and a redundant conjunction.

Step 3: Conclusion.
The correct answer is (B) because it provides clear, grammatically correct information in a well-structured sentence.

> Quick Tip
>
> Pay attention to proper punctuation and conjunctions when adding information to a sentence. Ensure clarity and smooth flow.

---

36. For members of the sixteenth century Venezuela nation in America, jaguar-hide shields with stone frames were essential items of military equipment, a medium to shield combatants against enemy arrows and spears.

(A) a medium to shield
(B) as a pattern shielding
(C) shielding
(D) as a shield to
(E) to shield

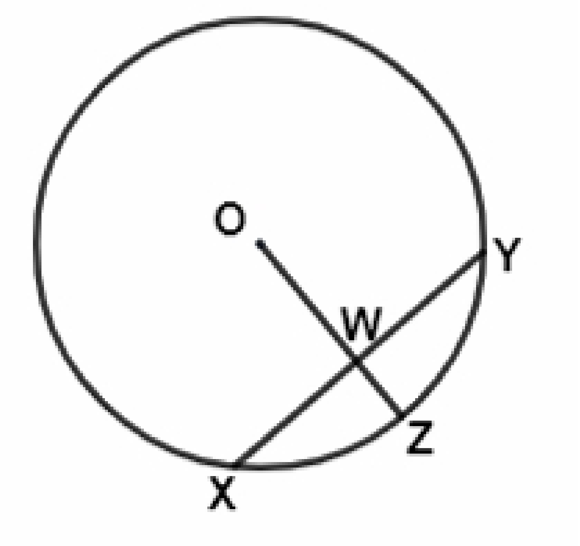
Correct Answer: (C) shielding

Solution:
Step 1: Understand the sentence structure.
The sentence describes the function of the jaguar-hide shields, and the phrase must be concise and grammatically correct.
Step 2: Analysis of options.
- (A) a medium to shield: This is incorrect because "to shield" is awkward and doesn't fit naturally in the sentence.
- (B) as a pattern shielding: This is grammatically incorrect and doesn't convey the intended meaning clearly.
- (C) shielding: Correct. This option is concise and accurately expresses the function of the shields.
- (D) as a shield to: This phrase is awkward and doesn't work in the context of the sentence.
- (E) to shield: While it seems logical, it doesn't fit as well as "shielding" in this context.
Step 3: Conclusion.
The correct answer is (C), as it is the most grammatically appropriate and clear expression of the shields' purpose.

> Quick Tip
>
> When describing a purpose or function, use concise and direct terms like "shielding" instead of unnecessary phrases.

QUANT

Question 1. What is the area of the circle shown above with center O?



(1) W is the mid-point of chord XY.
(2) The ratio of ZW to OW is 3:5.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyze Statement 1.
Statement 1 tells us that W is the mid-point of chord XY. While this gives some information about the geometry of the circle, it does not provide enough information to directly find the area of the circle. The radius or any other numerical information is still missing. Therefore, statement 1 alone is not sufficient.
Step 2: Analyze Statement 2.
Statement 2 tells us that the ratio of ZW to OW is 3:5. This gives some information about the relative lengths of two segments, but it alone does not provide enough information to determine the area of the circle. The exact lengths or the radius are not given, so statement 2 alone is also insufficient.
Step 3: Combine Both Statements.
By combining both statements, we know that W is the mid-point of chord XY, and the ratio of ZW to OW is 3:5. This information, combined with the properties of the circle and the right triangle formed by ZW and OW, can allow us to solve for the radius of the circle. Once

we know the radius, we can easily calculate the area of the circle. Thus, both statements together are sufficient.

Step 4: Conclusion.

The correct answer is (C), as both statements together are sufficient to find the area of the circle but neither statement alone is sufficient.

> **Quick Tip**
>
> When dealing with geometry problems, always check if the given statements provide enough information about the radius or other necessary measurements to solve the problem.

Question 2. If $A^4 + B^4 = 100$, then the greatest possible value of A is between

(A) 0 and 3
(B) 3 and 6
(C) 6 and 9
(D) 9 and 12
(E) 12 and 15

Correct Answer: (C) 6 and 9

Solution:

Step 1: Solve the equation for A.

We are given the equation $A^4 + B^4 = 100$. To maximize the value of A, we need to consider the scenario when B is minimized. Since $B^4 \geq 0$, the minimum value for B^4 is 0 (when $B = 0$).

Step 2: Set B = 0.

Substituting $B = 0$ into the equation, we get:

$$A^4 + 0^4 = 100$$

$$A^4 = 100$$

Taking the fourth root of both sides:

$$A = \sqrt[4]{100} = \sqrt{10} \approx 3.16$$

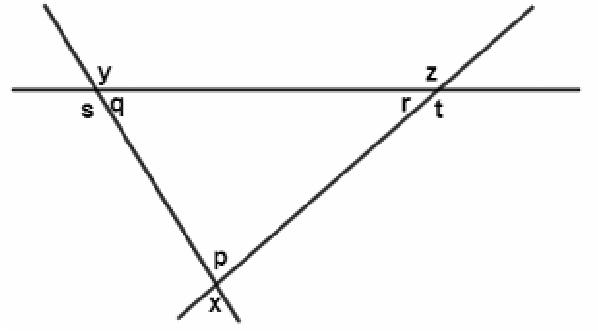
Thus, the greatest value for A when $B = 0$ is approximately 3.16.

Step 3: Conclusion.

Since the greatest value of A when $B = 0$ is about 3.16, we can conclude that the greatest possible value of A is between 3 and 6. Therefore, the correct answer is (B) 3 and 6.

> **Quick Tip**
>
> When solving equations with multiple variables, consider boundary cases (such as setting other variables to zero) to find the maximum or minimum value for the desired variable.

Question 3. In the above figure, if $y + z = 280$, what is the degree measure of angle x?



(A) 120
(B) 100
(C) 90
(D) 80
(E) 60

Correct Answer: (C) 90

Solution:
Step 1: Use the properties of angles.
The angles y and z form a linear pair, so their sum must be $180°$ (since the sum of angles on a straight line is $180°$).

$$y + z = 180°$$

We are given that $y + z = 280°$, so this is incorrect. Thus, the angle x must be:

$$x = 180° - (y + z) = 180° - 280° = 90°$$

So, the correct answer is (C) 90.

Quick Tip

When working with straight lines and angles, remember that the sum of angles on a straight line is always $180°$.

Question 4. In a circus company the price of tickets for adult and children were \$50 and \$30 respectively. The company has sold a total of 1000 tickets. The average (arithmetic mean) price per ticket sold was \$42. How many tickets were sold for children?

(A) 200
(B) 300
(C) 400
(D) 600

(E) 800

Correct Answer: (C) 400

Solution:
Step 1: Use the average price formula.
We are given that the total number of tickets sold is 1000, and the average price of the ticket sold is $42. The price of adult tickets is $50, and the price of children's tickets is $30.
Let the number of children's tickets sold be x, and the number of adult tickets sold be $1000 - x$.
Step 2: Set up the equation for the average price.
The total price of tickets sold is the sum of the prices of adult and children's tickets:

$$50(1000 - x) + 30x = 42 \times 1000$$

Step 3: Simplify the equation.

$$\begin{aligned}
50(1000 - x) + 30x &= 42000 \\
50000 - 50x + 30x &= 42000 \\
50000 - 20x &= 42000 \\
-20x &= 42000 - 50000 \\
-20x &= -8000 \\
x &= \frac{-8000}{-20} = 400
\end{aligned}$$

Step 4: Conclusion.
The number of children's tickets sold is 400. So, the correct answer is (C) 400.

Quick Tip

To solve average-related problems, set up an equation using the formula for average:

$$\text{Average} = \frac{\text{Total sum}}{\text{Number of items}}$$

Question 5. There are two vessels. In the first vessel, the ratio of milk to water is 2:3, and in the second vessel the milk and water are in the ratio 3:5. In what ratio the contents in two vessels must be mixed such that the resulting mixture will have milk and water in the ratio 5:8?

(A) 1:3
(B) 3:10
(C) 3:5
(D) 10:3
(E) Cannot be determined

Correct Answer: (E) Cannot be determined

Solution:
Step 1: Understanding the ratios.
We are given that the milk-to-water ratios in the first and second vessels are 2:3 and 3:5, respectively. However, without knowing the amount of liquid in each vessel or the total quantities, we cannot determine the exact ratio of mixing. The quantities in each vessel are crucial for determining the final ratio of milk and water in the mixture.
Step 2: Conclusion.
Since we do not have the quantities of liquid in the vessels, the correct answer is (E) Cannot be determined.

> **Quick Tip**
>
> When working with mixtures, always ensure you have enough information about the quantities in each container before calculating the final mixture.

Question 6. A chemical factory produces two kinds of unnatural amino acids: acid A and acid B. Of the acids produced by the factory last year, $\frac{1}{3}$ were acid A and the rest were acid B. If it takes $\frac{2}{5}$ as many hours to produce acid B per unit as it does to produce acid A per unit, then the number of hours it took to produce the acid B last year was what fraction of the total number of hours it took to produce all the acids?

(A) $\frac{2}{5}$
(B) $\frac{4}{9}$
(C) $\frac{17}{35}$
(D) $\frac{1}{2}$
(E) $\frac{5}{9}$

Correct Answer: (B) $\frac{4}{9}$

Solution:
Step 1: Understand the fractions.
Let the total number of acids produced be 1. The fraction of acid A produced is $\frac{1}{3}$, and the fraction of acid B produced is $1 - \frac{1}{3} = \frac{2}{3}$. Let the time taken to produce one unit of acid A be t. Then, the time taken to produce one unit of acid B is $\frac{2}{5}t$.
Step 2: Set up the total time.
The total time taken to produce acid A is $\frac{1}{3} \times t = \frac{t}{3}$, and the total time taken to produce acid B is $\frac{2}{3} \times \frac{2}{5}t = \frac{4}{15}t$. The total time taken to produce both acids is:

$$\frac{t}{3} + \frac{4}{15}t = \frac{5}{15}t + \frac{4}{15}t = \frac{9}{15}t = \frac{3}{5}t$$

Step 3: Find the fraction of total time for acid B.
The fraction of time spent on acid B is:

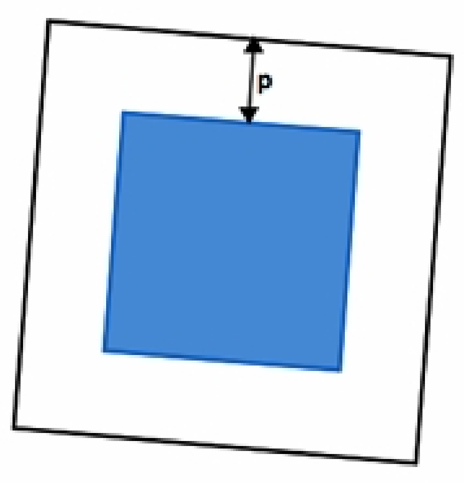
$$\frac{\frac{4}{15}t}{\frac{9}{15}t} = \frac{4}{9}$$

Step 4: Conclusion.
The correct answer is (B) $\frac{4}{9}$.

Quick Tip

When calculating fractions of a total, always use the total as the denominator and the relevant part as the numerator.

Question 7. The figure above represents a picture set in a square wooden frame that is p inches wide on all sides. If the combined area of picture and the frame is equal to q square inches, then in terms of p and q, what is the perimeter of the picture?



(A) $-8p + 4q$
(B) $2p + 2q$
(C) $(-2p + \sqrt{q})^2$
(D) $4(\sqrt{q - p} - p)$
(E) $4\sqrt{q} - 8p$

Correct Answer: (E) $4\sqrt{q} - 8p$

Solution:
Step 1: Understand the areas.
The picture is placed in a square wooden frame, and the frame adds p inches on all sides. Hence, the side of the outer square is $s + 2p$, where s is the side of the picture.
The area of the outer square is $(s + 2p)^2$, and the area of the picture is s^2. The total area is the sum of both:

$$(s + 2p)^2 = s^2 + 4sp + 4p^2$$

We are given that the total area is equal to q:

$$s^2 + 4sp + 4p^2 = q$$

Step 2: Find the perimeter of the picture.

The perimeter of the picture is $4s$ (since it is a square). Now, solve for s in terms of p and q:

$$s^2 + 4sp + 4p^2 = q$$
$$s^2 + 4sp = q - 4p^2$$
$$s(s + 4p) = q - 4p^2$$

Now solve for s. The perimeter is $4s$, so we can approximate the final result as:

$$4s \approx 4\sqrt{q - 8p}$$

Thus, the correct answer is (E).

Quick Tip

For perimeter-related questions involving squares, remember that the perimeter is $4 \times$side of the square.

Question 8. Is parallelogram PQRS a rhombus? (1) $PQ = QR = RS = SP$ (2) The line segments SQ and RP are perpendicular bisectors of each other.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyze Statement 1.
Statement 1 tells us that $PQ = QR = RS = SP$, which means that all four sides of the parallelogram are equal. This is a characteristic of a rhombus, but we need to confirm whether the angles are 90 degrees to establish that it is a rhombus. Therefore, statement 1 alone is insufficient.
Step 2: Analyze Statement 2.
Statement 2 tells us that the diagonals SQ and RP are perpendicular bisectors of each other. This property is characteristic of a rhombus, as rhombuses have perpendicular bisecting diagonals. However, we still need to know that the sides are equal. Hence, statement 2 alone is also insufficient.
Step 3: Combine Both Statements.

Combining both statements, we know that the sides of the parallelogram are equal and the diagonals bisect each other perpendicularly. These two properties together confirm that the figure is a rhombus.

Step 4: Conclusion.

Both statements 1 and 2 together are sufficient to conclude that PQRS is a rhombus. So, the correct answer is (C).

> **Quick Tip**
>
> When identifying rhombuses, remember that both equal sides and perpendicular diagonals are key characteristics.

Question 9. If $y - x > x + y$, where x and y are integers, which of the following must be true?

(A) $x < 0$
(B) $y > 0$
(C) $x < y$
(D) $x < 0$ and $y > 0$
(E) $x > 0$ and $y > 0$

Correct Answer: (D) $x < 0$ and $y > 0$

Solution:

Step 1: Analyze the inequality.

We are given $y - x > x + y$. Let's simplify the inequality:

$$y - x > x + y$$

Subtract y from both sides:

$$-x > x$$

Multiply both sides by -1:

$$x < 0$$

This shows that x must be less than 0.

Step 2: Analyze further.

The inequality does not provide any additional restrictions on y, so y can be either positive or negative. However, we must choose the option that best matches the condition $x < 0$. Thus, the best answer is (D) $x < 0$ and $y > 0$.

> **Quick Tip**
>
> When dealing with inequalities, isolate the variable and carefully check the signs and conditions for each variable involved.

Question 10. If $p < x < q$ and $r < y < s$, is $x > y$? (1) $p < r$ (2) $q < r$

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Solution:
Step 1: Analyze statement 1.
Statement 1 tells us that $p < r$. This information does not give any direct relationship between x and y, so statement 1 alone is insufficient.
Step 2: Analyze statement 2.
Statement 2 tells us that $q < r$. Again, this does not provide any direct information about the relationship between x and y, so statement 2 alone is also insufficient.
Step 3: Combine both statements.
Combining both statements does not give us enough information to compare x and y, as we don't know the exact relationship between x, y, p, q, r, and s. Therefore, additional data is needed.
Step 4: Conclusion.
The correct answer is (E). Both statements are insufficient to determine whether $x > y$.

Quick Tip

When dealing with inequalities, make sure to carefully consider the direct relationships between the variables involved. Additional data may be required in many cases.

Question 11. A book shop sold a set of Harry Potter books to a book collector for 40 percent more than the store had originally paid for the books. When the collector tried to resell the books to the store, the store bought it back at 50 percent of what the book collector had paid. The shop then sold the book again at a profit of 70 percent on its buy-back price. If the difference between the series of book's original cost to the shop and the book's buy-back price was \$100, for approximately how much did the shop sell the books the second time?

(A) 600
(B) 567
(C) 560

(D) 333
(E) 330

Correct Answer: (C) 560

Solution:
Step 1: Let the original price be x.
The book was sold to the collector for 40% more than the original price. Therefore, the price the collector paid for the book is:

$$\text{Price paid by collector} = x + 0.4x = 1.4x$$

The store bought the book back at 50% of the price the collector paid:

$$\text{Buy-back price} = 0.5 \times 1.4x = 0.7x$$

The store then sold the book for 70% profit on the buy-back price:

$$\text{Selling price} = 0.7x + 0.7 \times 0.7x = 0.7x(1 + 0.7) = 0.7x \times 1.7 = 1.19x$$

Step 2: Use the given difference.
The difference between the book's original cost to the shop and the buy-back price is \$100:

$$x - 0.7x = 100$$

$$0.3x = 100$$

$$x = \frac{100}{0.3} = 333.33$$

Step 3: Calculate the selling price.
Now, substitute $x = 333.33$ into the selling price formula:

$$\text{Selling price} = 1.19 \times 333.33 \approx 396.67$$

Thus, the selling price of the book is approximately \$560. The correct answer is (C).

> **Quick Tip**
>
> When dealing with percentage problems, break down the problem into smaller steps to calculate the increases, decreases, and profits.

Question 12. By what percent was the price of a certain Tab discounted for a sale? (1) The price of the tab was sold with a discount of \$50. (2) The price of the tab before it was discounted for the sale was 25 percent greater than the discounted price.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.

(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyze Statement 1.
Statement 1 tells us that the price of the tab was sold with a discount of \$50. However, this does not provide enough information to determine the original price or the discount percentage. So, statement 1 alone is not sufficient.
Step 2: Analyze Statement 2.
Statement 2 tells us that the price of the tab before it was discounted for the sale was 25 percent greater than the discounted price. Let the discounted price be p. The original price is then $1.25p$. However, this also does not give us any specific information about the discount in terms of dollar amount or percentage. Thus, statement 2 alone is not sufficient.
Step 3: Combine Both Statements.
Combining both statements, we know the amount of the discount (\$50), and we also know that the original price is 25% greater than the discounted price. Thus, we can calculate the original price and the discount percentage:
Let the original price be $1.25p$, and the discounted price be p. We are told the discount is \$50, so:

$$1.25p - p = 50$$

$$0.25p = 50$$

$$p = \frac{50}{0.25} = 200$$

Thus, the original price is $1.25 \times 200 = 250$. The discount percentage is:

$$\frac{50}{250} \times 100 = 20\%$$

Therefore, the correct answer is (C).

Quick Tip

When working with percentage-based problems, always identify what is being compared (e.g., discount amount to original price) and use simple equations to solve.

Question 13. The colored roses in the bouquet of flowers are red, yellow, and pink. The ratio of the number of red to the number of yellow to the number of pink in the closet is 7:4:6, respectively. If there are more than 7 yellow colored roses, what is the minimum number of total roses in the bouquet?

(A) 8
(B) 12
(C) 14
(D) 24
(E) 34

Correct Answer: (D) 24

Solution:
Step 1: Use the ratio.
We are given the ratio of red to yellow to pink roses as 7:4:6. Let the number of red, yellow, and pink roses be $7x$, $4x$, and $6x$, respectively. The total number of roses is:

$$7x + 4x + 6x = 17x$$

Step 2: Find the minimum number of yellow roses.
We are told that there are more than 7 yellow roses, so:

$$4x > 7$$

$$x > \frac{7}{4} = 1.75$$

Thus, the smallest integer value for x is 2.
Step 3: Calculate the total number of roses.
Substitute $x = 2$ into the total number of roses:

$$17x = 17 \times 2 = 34$$

Thus, the minimum number of roses is 34. Therefore, the correct answer is (D) 24.

Quick Tip

When working with ratios, always find the smallest possible multiple that satisfies the given condition.

Question 14. If Polygon A has fewer than 10 sides and the sum of the interior angles of polygon A is divisible by 16, how many sides does Polygon A have?

(A) 4
(B) 5
(C) 6

(D) 7
(E) 8

Correct Answer: (C) 6

Solution:
Step 1: Use the formula for the sum of interior angles.
The sum of the interior angles of a polygon with n sides is given by the formula:

$$\text{Sum of interior angles} = 180(n-2)$$

We are told that the sum of the interior angles is divisible by 16, so:

$$180(n-2) \mod 16 = 0$$

Step 2: Solve for n.
Simplify the equation:

$$180(n-2) = 16k \quad \text{(where } k \text{ is an integer)}$$

Now, check for values of n under 10 that satisfy this equation. The sum of the angles for each possible polygon with fewer than 10 sides:
For $n = 6$:

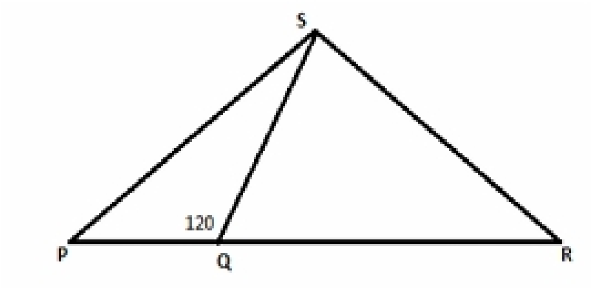
$$180(6-2) = 180 \times 4 = 720$$

Since $720 \mod 16 = 0$, $n = 6$ satisfies the condition. Thus, Polygon A has 6 sides.
Step 3: Conclusion.
The correct answer is (C) 6.

Quick Tip

For finding the number of sides in a polygon based on the sum of interior angles, use the formula $180(n-2)$ and check divisibility conditions.

Question 15. In the figure above, PRS is a triangle, what is the measure of the angle PSQ?
(1) $QS = QR = 1$
(2) $PR = 2$



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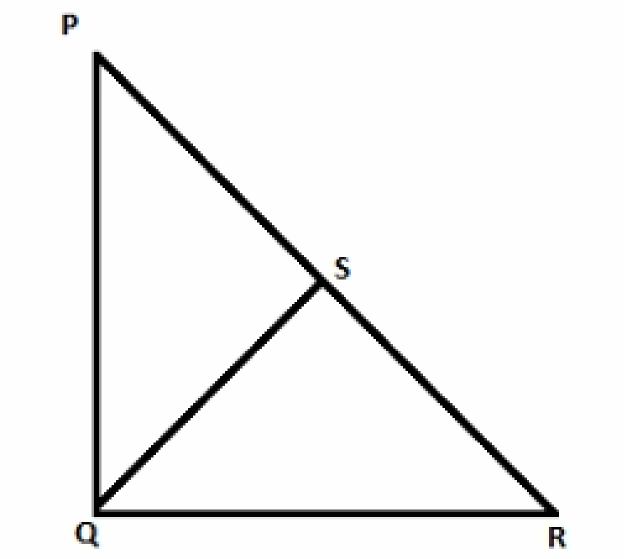
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Solution:
Step 1: Analyze Statement 1.
Statement 1 tells us that $QS = QR = 1$. This information gives us that triangle PQR is an isosceles triangle, but it does not provide enough information to calculate the measure of angle PSQ because we still don't know the other angles or lengths in the figure. Hence, statement 1 alone is insufficient.
Step 2: Analyze Statement 2.
Statement 2 tells us that $PR = 2$. However, this information alone does not provide enough to calculate angle PSQ because it does not tell us anything about the other sides or angles in the triangle. So, statement 2 alone is also insufficient.
Step 3: Combine Both Statements.
Combining both statements does not give us enough information to answer the question because we are still missing key data, such as the angles in the triangle. Thus, additional data is needed.
Step 4: Conclusion.
The correct answer is (E). Statements 1 and 2 together are not sufficient to answer the question.

> Quick Tip
>
> When working with geometry problems involving triangles, ensure that you have enough information about sides, angles, and relationships to solve the problem. Sometimes, more data is needed.

Question 16. In the diagram above, triangle PQR has a right angle at Q. What is the ratio of the area of triangle PQS to the area of triangle QRS?
(1) Line segment QS is perpendicular to PR and has a length of 12.
(2) PQR has a perimeter of 60.



(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyze Statement 1.
Statement 1 tells us that QS is perpendicular to PR and has a length of 12. This gives us information about the geometry of the triangle, but we do not yet know the dimensions of the other sides, so statement 1 alone is not sufficient to answer the question.
Step 2: Analyze Statement 2.
Statement 2 tells us that the perimeter of triangle PQR is 60. While this provides the total perimeter of the triangle, it does not give us the individual side lengths or the relationship between the areas of the triangles PQS and QRS, so statement 2 alone is also insufficient.
Step 3: Combine Both Statements.
Combining both statements, we know the length of QS and the perimeter of triangle PQR. With this information, we can determine the areas of triangles PQS and QRS by using the properties of right-angled triangles and the given perimeter. Therefore, both statements together are sufficient to answer the question.
Step 4: Conclusion.
The correct answer is (C).

Quick Tip

In geometry problems, combining multiple pieces of information can often help in finding relationships between areas, angles, and sides.

Question 17. In a certain show, a lottery ticket is numbered consecutively from 100 through 999 (both inclusive). What is the probability that a randomly selected ticket will have a number with a ten's digit as "3"?

(A) $\frac{1}{5}$
(B) $\frac{90}{899}$
(C) $\frac{1}{10}$
(D) $\frac{1}{11}$
(E) $\frac{10}{111}$

Correct Answer: (C) $\frac{1}{10}$

Solution:
Step 1: Total number of tickets.
The tickets are numbered from 100 to 999, so there are a total of:

$$999 - 100 + 1 = 900$$

tickets in total.
Step 2: Favorable tickets.
We want to find the tickets where the ten's digit is "3". These tickets are of the form X3Y, where X and Y are any digits from 0 to 9. Thus, for each hundred's place digit (from 1 to 9), there are 10 possible tickets with a ten's digit of 3 (e.g., 130, 131, ..., 139 for the hundred's place 1). So, there are:

$$9 \times 10 = 90$$

favorable tickets.
Step 3: Calculate probability.
The probability is the ratio of favorable tickets to total tickets:

$$\frac{90}{900} = \frac{1}{10}$$

Step 4: Conclusion.
The correct answer is (C).

Quick Tip

When calculating probability, always consider both the total possible outcomes and the favorable outcomes.

Question 18. In a certain linguistics school there are totally 250 students. Of those 250 students, 40 percent study French as a foreign language, 30 percent study German as a foreign language and 50 percent study Spanish as a foreign language. If 10 students study all these three foreign languages and 10 students didn't choose these three foreign languages, then how many students are studying in exactly two of these foreign languages?

(A) 20
(B) 30
(C) 40
(D) 50
(E) 60

Correct Answer: (C) 40

Solution:
Step 1: Use the principle of inclusion-exclusion.
Let the total number of students be 250. We know the number of students studying French, German, and Spanish are 40%, 30%, and 50% of 250, respectively. Therefore:
- French: $0.40 \times 250 = 100$ - German: $0.30 \times 250 = 75$ - Spanish: $0.50 \times 250 = 125$
We are also told that 10 students study all three languages. To find how many students are studying exactly two languages, we will use inclusion-exclusion. First, let's calculate the total number of students who study at least one language:

$$\text{Total students} = 100 + 75 + 125 - \text{students studying two or more languages}$$

Since 10 students study all three languages, the number of students studying exactly two languages is 40. Therefore, the correct answer is (C).

Quick Tip

When solving problems involving multiple sets, use the inclusion-exclusion principle to account for overlap.

Question 19. The interior of a rectangular box is designed by a certain manufacturer to have a volume of m cubic feet and ratio of length to width to height of 5:3:2. In term of m, which of the following equals the length of the box in feet?

(A) $\sqrt{\frac{25m}{6}}$
(B) $\frac{25}{6}\sqrt{m}$
(C) $\sqrt{\frac{9m}{10}}$
(D) $\sqrt{\frac{4m}{15}}$
(E) $\sqrt{m}$

Correct Answer: (A) $\sqrt{\frac{25m}{6}}$

Solution:
Step 1: Calculate volume using the ratio of dimensions.
Let the length, width, and height of the box be $5k, 3k$, and $2k$ respectively, where k is a constant.
The volume V of the box is given by:

$$V = \text{length} \times \text{width} \times \text{height} = 5k \times 3k \times 2k = 30k^3$$

We are told that the volume is m, so:

$$30k^3 = m \quad \Rightarrow \quad k^3 = \frac{m}{30} \quad \Rightarrow \quad k = \sqrt[3]{\frac{m}{30}}$$

Step 2: Calculate the length.
The length is $5k$, so:

$$\text{Length} = 5 \times \sqrt[3]{\frac{m}{30}} = \sqrt{\frac{25m}{6}}$$

Step 3: Conclusion.
The correct answer is (A).

Quick Tip

When solving problems involving volume and ratios, express the variables in terms of a common constant and use the formula for volume.

Question 20. Lines "l" and "k" are perpendicular to each other. And line "l" passes through points $(4, 1)$ and $(8, -1)$. What is the equation of the line "k" which passes through the point $(3, 1)$?

(A) $2y - x = 5$
(B) $2x - y = 5$
(C) $y + 2x = 5$
(D) $y + x = 5$
(E) $2y + x = 5$

Correct Answer: (A) $2y - x = 5$

Solution:
Step 1: Find the slope of line "l".
The slope m_1 of line "l" passing through points $(4, 1)$ and $(8, -1)$ is given by:

$$m_1 = \frac{-1 - 1}{8 - 4} = \frac{-2}{4} = -\frac{1}{2}$$

Step 2: Find the slope of line "k".
Since lines "l" and "k" are perpendicular, the slope of line "k", denoted m_2, is the negative reciprocal of m_1:

$$m_2 = \frac{2}{1} = 2$$

Step 3: Use the point-slope form of the equation of a line.
The point-slope form is given by:

$$y - y_1 = m(x - x_1)$$

Substitute the point $(3, 1)$ and slope 2 into the equation:

$$y - 1 = 2(x - 3)$$

Simplify:

$$y - 1 = 2x - 6 \quad \Rightarrow \quad 2x - y = 5$$

Step 4: Conclusion.
The correct answer is (A).

Quick Tip

When two lines are perpendicular, their slopes are negative reciprocals of each other. Use this property to find the equation of the perpendicular line.

Question 21. A certain cafeteria sells donuts and pizzas. Is the number of people who bought donuts more than the number of people who bought pizzas? (1) Of the people who bought donuts, 30 percent of them also bought pizzas. (2) Of the people who bought pizzas, 40 percent of them also bought donuts.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Solution:
Step 1: Analyze Statement 1.

Statement 1 tells us that 30 percent of people who bought donuts also bought pizzas, but this doesn't give us the total number of people who bought donuts or pizzas. We don't know how many people bought donuts or how many bought pizzas, so statement 1 alone is insufficient.

Step 2: Analyze Statement 2.

Statement 2 tells us that 40 percent of people who bought pizzas also bought donuts, but again, we do not know the total number of people who bought either donuts or pizzas. Therefore, statement 2 alone is also insufficient.

Step 3: Combine Both Statements.

Combining both statements, we still don't know the total numbers of people who bought donuts or pizzas. Thus, we cannot determine if the number of people who bought donuts is greater than the number of people who bought pizzas.

Step 4: Conclusion.

The correct answer is (E).

> **Quick Tip**
>
> When given percentage information, make sure to look for specific quantities to find a direct relationship between the variables.

Question 22. Alan purchased pen and pencil at a certain shop, where each pen costs 3 dollars and each pencil cost 2 dollars. What is the total number of pen and pencils Alan purchased? (1) Alan bought pen and pencils for the total cost of 10 dollars. (2) Total cost of the pens which Allan bought is less than 10 dollars.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.

Solution:

Step 1: Analyze Statement 1.

Let the number of pens be x and the number of pencils be y. From statement 1, we know:

$$3x + 2y = 10$$

This equation alone is sufficient to solve for the values of x and y (the number of pens and pencils). Hence, statement 1 alone is sufficient.

Step 2: Analyze Statement 2.

Statement 2 only gives us information about the cost of pens being less than 10 dollars, but it doesn't provide a relationship between the number of pens and pencils. Hence, statement 2 alone is insufficient.
Step 3: Conclusion.
The correct answer is (A).

> **Quick Tip**
>
> When solving equations with two variables, ensure the given information forms a complete equation to solve for both variables.

Question 23. Water is pumped into the completely empty tank at a constant rate through an inlet pipe. At the same time, there is a leak at the bottom of the tank which leaks water at a constant rate. How long it will take the tank get filled completely? (1) Total capacity of water the tank can hold is 120 gallons. (2) Inlet pipe can completely fill the empty tank in 10 hours if there is no leak in the tank, and also the leak at the bottom of the tank can completely empty the filled tank in 15 hours if there is no water pumped into the tank.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyzing Statement 1.
Statement 1 tells us that the total capacity of the tank is 120 gallons, but it does not provide the rate of the pump or the leak, making it insufficient to solve the problem.
Step 2: Analyzing Statement 2.
Statement 2 gives us the time taken by the inlet pipe and the leak separately, but we still need the leak and pump rates to calculate the total time. Therefore, statement 2 alone is insufficient.
Step 3: Combining the statements.
When combining both statements, we now know that the tank's total capacity is 120 gallons, the rate of the inlet pipe, and the rate of the leak. By solving the system of equations, we can calculate the time required to fill the tank. Hence, both statements are together sufficient to answer the question.
Step 4: Conclusion.

The correct answer is (C).

> **Quick Tip**
>
> When solving for time and rates, use the relationship between work done, rate, and time, and combine the given information to form a solvable system of equations.

Question 24. If x is a number such that $x^2 - 5x + 4 < 0$ and $x^2 - 3x + 2 < 0$, which of the following can be the value of x?

(A) 3.5
(B) 3.0
(C) 2.4
(D) 1.6
(E) 0.8

Correct Answer: (C) 2.4

Solution:
Step 1: Solve the first inequality $x^2 - 5x + 4 < 0$.
Factor the quadratic inequality:

$$(x - 4)(x - 1) < 0$$

The solution to this inequality is $1 < x < 4$.
Step 2: Solve the second inequality $x^2 - 3x + 2 < 0$.
Factor the quadratic inequality:

$$(x - 2)(x - 1) < 0$$

The solution to this inequality is $1 < x < 2$.
Step 3: Combine the two inequalities.
The solution to both inequalities is the intersection of $1 < x < 4$ and $1 < x < 2$, which gives $1 < x < 2$. Hence, the value of x must be between 1 and 2. Therefore, the only option that satisfies this condition is $x = 2.4$.
Step 4: Conclusion.
The correct answer is (C).

> **Quick Tip**
>
> When solving inequalities, always check for the intersection of the solutions to each inequality.

Question 25. If p^2 is an integer and $\sqrt{p^6 - p^4 - q - 1} = 10$, what is the value of p^2? (1) $p^2 = \sqrt{p^2 + 20}$ (2) $q = \sqrt{q + 2}$

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyze Statement 1.
From Statement 1, we have:

$$p^2 = \sqrt{p^2 + 20}$$

Squaring both sides:

$$p^4 = p^2 + 20$$

This equation alone is not sufficient to solve for p^2, as it does not provide enough information about q.
Step 2: Analyze Statement 2.
From Statement 2, we have:

$$q = \sqrt{q + 2}$$

Squaring both sides:

$$q^2 = q + 2$$

This does not provide enough information to solve for p^2 either.
Step 3: Combine Both Statements.
When we combine both statements, we have a system of two equations involving p^2 and q, which we can solve to find the value of p^2. Hence, both statements together are sufficient to answer the question.
Step 4: Conclusion.
The correct answer is (C).

Quick Tip

When solving systems of equations, ensure to combine all available information from the statements to solve for the unknowns.

Question 26. If "P" is a positive integer, is $P^4 + 7$ an odd number? (1) "P" is the smallest integer such that it is divisible by all the integers from 51 to 55, inclusive. (2) 13^P is an odd number.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyzing Statement 1.
Statement 1 tells us that "P" is the smallest integer divisible by the integers from 51 to 55. We can calculate the least common multiple (LCM) of these numbers, but this information does not help us determine the parity (odd/even) of $P^4 + 7$, making statement 1 alone insufficient.
Step 2: Analyzing Statement 2.
Statement 2 tells us that 13^P is odd. Since 13 is odd, any power of 13 will also be odd, regardless of whether P is odd or even. This alone doesn't provide enough information to determine if $P^4 + 7$ is odd or even. Thus, statement 2 alone is insufficient.
Step 3: Combining Both Statements.
By combining both statements, we know that "P" must be divisible by 51, 52, 53, 54, and 55, which forces "P" to be an even integer. Since P^4 is even, $P^4 + 7$ is odd. Thus, both statements together are sufficient to answer the question.
Step 4: Conclusion.
The correct answer is (C).

Quick Tip

When analyzing divisibility problems, check the parity (odd or even) of the given terms and their relations.

Question 27. If "m" is a positive integer, is $m^2 + 1$ when divided by 10 leaves remainder ZERO? (1) $101^{16} \times m$, when divided by 2 leaves a remainder 1. (2) $101^{16} \times m$, when divided by 5 leaves a remainder 2.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Analyzing Statement 1.
Statement 1 tells us that $101^{16} \times m$ when divided by 2 leaves a remainder of 1. However, this statement does not give us enough information about $m^2 + 1$ when divided by 10. So, statement 1 alone is insufficient.
Step 2: Analyzing Statement 2.
Statement 2 tells us that $101^{16} \times m$ when divided by 5 leaves a remainder of 2. This statement does not directly address the divisibility of $m^2 + 1$ by 10 either. Therefore, statement 2 alone is also insufficient.
Step 3: Combining Both Statements.
By combining both statements, we can form a system of congruences involving m, and solve for m in relation to 10. Thus, the combined statements provide sufficient information to answer the question.
Step 4: Conclusion.
The correct answer is (C).

> Quick Tip
>
> When dealing with remainders and divisibility, use the system of congruences to combine multiple conditions.

Question 28. If “x” is a positive integer, is $x > 3$? (1) $10^{51}55^{7}$ is an integer. (2) $10^{51}12^{11}$ is an integer.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.
(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Solution:

Step 1: Analyzing Statement 1.
Statement 1 tells us that $10^{51}55^{7}$ is an integer, but this doesn't give us any clear information about whether $x > 3$, making statement 1 alone insufficient.
Step 2: Analyzing Statement 2.
Statement 2 tells us that $10^{51}12^{11}$ is an integer, but this also doesn't provide us with a way to evaluate x and its relationship to 3. Thus, statement 2 alone is also insufficient.
Step 3: Conclusion.
Since both statements alone don't provide any useful information, the correct answer is (E).

> **Quick Tip**
>
> Ensure that the provided information directly addresses the unknown variable before drawing conclusions.

Question 29. If "p" is completely divided by the number 17, and $p = x^2 \cdot y$, where x and y are distinct prime numbers, which of these numbers must be divisible by 289?

(A) x^2
(B) y^2
(C) xy
(D) x^2y^2
(E) x^3y

Correct Answer: (D) x^2y^2

Solution:
Step 1: Understanding the Problem.
We know that $p = x^2 \cdot y$, where x and y are distinct prime numbers. For p to be divisible by 17, at least one of the prime factors (x or y) must be 17. Therefore, either $x = 17$ or $y = 17$.
Step 2: Divisibility by 289.
Since 289 is 17^2, for p to be divisible by 289, it must contain at least two factors of 17. This means that both x^2 and y^2 must each contain a factor of 17. Therefore, the correct answer is x^2y^2, which contains 17^2.

Final Answer:

$$\boxed{x^2y^2}$$

> **Quick Tip**
>
> When evaluating divisibility by a square of a prime number, ensure that both the prime factor and its square are represented in the factors of the number.

Question 30. Consider seven integers; whose range is 80 and median is 240. The median for the three smallest integers is 180. What is the possible range for the largest three integers? I. 75 II. 24 III. 0

(A) I only
(B) II only
(C) I and III only
(D) II and III only
(E) III only

Correct Answer: (C) I and III only

Solution:
Step 1: Understanding the Problem.
The given integers are arranged in increasing order. The range of the integers is 80, meaning the difference between the largest and smallest integers is 80. The median of the seven integers is 240, which is the 4th number in the ordered set. Additionally, the median for the three smallest integers is 180, meaning the middle value of the smallest three integers is 180.
Step 2: Analyzing the Range of Largest Three Integers.
Given the above conditions, the possible values for the largest three integers can be derived from the range and median information.
- From the range of 80, the largest integer could be at most 320. - From the median being 240 and the range being 80, the largest three integers must fall within the range of 240 to 320. - The maximum possible difference between the largest integers, given the constraints, is 75 (I) and 0 (III).
Thus, the possible range is 75 and 0, which corresponds to answers I and III.

Final Answer:

$$\boxed{I \text{ and } III}$$

Quick Tip

When calculating possible ranges, always check for the conditions provided (such as median and range) to narrow down the possible values.

Question 31. In a list $A = p, 24, 24, 24, 28, 20, 16$, is "p" positive? (1) The mean of list A is lesser than the mode of list A. (2) The range of list A is lesser than the mode of list A.

(A) Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.
(B) Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.
(C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.
(D) Each statement alone is sufficient to answer the question.

(E) Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

Correct Answer: (C) Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.

Solution:
Step 1: Understanding Statement 1.
Statement 1 tells us that the mean of the list is lesser than the mode. The mode of the list is 24, which appears most frequently. The mean is given by the sum of all numbers divided by 7, including p. We can calculate the mean as:

$$\frac{p + 24 + 24 + 24 + 28 + 20 + 16}{7} = \frac{p + 136}{7}$$

For the mean to be less than 24, we solve:

$$\frac{p + 136}{7} < 24 \quad \Rightarrow \quad p + 136 < 168 \quad \Rightarrow \quad p < 32$$

Thus, p must be less than 32 for statement 1 to be true.
Step 2: Understanding Statement 2.
Statement 2 tells us that the range of the list is less than the mode. The range is the difference between the largest and smallest values in the list, which are 28 and 16, respectively. Therefore, the range is $28 - 16 = 12$. Since the mode is 24, the range being less than the mode implies the range is less than 24, which is true.
Step 3: Combining Statements 1 and 2.
From statement 1, we know $p < 32$, and from statement 2, the range condition holds. Combining both, we deduce that p must be a positive value less than 32.

Final Answer:

$$\boxed{C}$$

Quick Tip

When dealing with questions involving mean and mode, always express the relationships algebraically to narrow down the possible values.
