GMAT 2025 Sample Set 3 Question Paper with Solutions

| **Time Allowed :**2 Hours 15 Minutes | **Maximum Marks :**205-805 | **Total Questions :**64 |

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.

Quantitative Aptitude

1. The HCF of two numbers is 5 and their LCM is 60. How many pairs of such numbers are possible?

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

Correct Answer: (C) 2

Solution:

Step 1: Understanding the Concept:
This problem involves the relationship between the Highest Common Factor (HCF) and the Least Common Multiple (LCM) of two numbers.

Step 2: Key Formula or Approach:
There are two key properties we will use: 1. For any two positive integers a and b, $\text{HCF}(a, b) \times \text{LCM}(a, b) = a \times b$.
2. If the HCF of two numbers is h, the numbers can be expressed as hx and hy, where x and y are co-prime integers (i.e., their HCF is 1).

Step 3: Detailed Explanation:
We are given HCF = 5 and LCM = 60.
Using the second property, let the two numbers be $5x$ and $5y$, where x and y are co-prime.
Now, using the first property:
$$(5x) \times (5y) = 5 \times 60$$
$$25xy = 300$$
$$xy = \frac{300}{25}$$
$$xy = 12$$
We need to find pairs of co-prime integers (x, y) whose product is 12. The possible pairs of integers whose product is 12 are: (1, 12), (2, 6), and (3, 4).
Now we check which of these pairs are co-prime:

- **Pair (1, 12):** HCF(1, 12) = 1. They are co-prime. This is a valid pair.

- **Pair (2, 6):** HCF(2, 6) = 2. They are not co-prime. This is not a valid pair.

- **Pair (3, 4):** HCF(3, 4) = 1. They are co-prime. This is a valid pair.

We have found two valid pairs for (x, y). Let's find the corresponding pairs of numbers:

1. For $(x, y) = (1, 12)$, the numbers are $(5 \times 1, 5 \times 12) = (5, 60)$.

2. For $(x, y) = (3, 4)$, the numbers are $(5 \times 3, 5 \times 4) = (15, 20)$.

There are 2 such pairs of numbers.

Step 4: Final Answer:
The two possible pairs are (5, 60) and (15, 20). Therefore, there are 2 possible pairs.

> **Quick Tip**
>
> Always remember the fundamental relationship: Product of two numbers = Product of their HCF and LCM. When given the HCF, immediately represent the numbers as multiples of the HCF with co-prime factors. This simplifies the problem significantly.

2. A raisin is a dehydrated grape. A natural grape contains 90% of water(by weight), and raisins contain 25% of water(by weight). How much weight of natural grapes (in kg) is required to make 4kgs of raisin?

(A) 30
(B) 35
(C) 40
(D) 45
(E) 50

Correct Answer: (A) 30

Solution:

Step 1: Understanding the Concept:
This is a mixture problem focusing on percentages. The key insight is that the amount of solid material (pulp) remains constant when a grape dehydrates into a raisin; only the amount of water changes.

Step 2: Detailed Explanation:
First, let's determine the percentage of pulp in both grapes and raisins.

- Natural Grape: Contains 90% water, so it contains $100\% - 90\% = 10\%$ pulp.

- Raisin: Contains 25% water, so it contains $100\% - 25\% = 75\%$ pulp.

We want to produce 4 kg of raisins. Let's calculate the amount of pulp in these raisins.

$$\text{Weight of pulp in raisins} = 75\% \text{ of 4 kg} = 0.75 \times 4 = 3 \text{ kg}$$

This 3 kg of pulp must have come from the original natural grapes, as the pulp does not change weight. Now, we need to find the total weight of natural grapes that would contain 3 kg of pulp. We know that pulp makes up 10% of the weight of natural grapes.
Let W be the required weight of natural grapes.

$$10\% \text{ of } W = 3 \text{ kg}$$

$$0.10 \times W = 3$$

$$W = \frac{3}{0.10}$$

$$W = 30 \text{ kg}$$

Step 3: Final Answer:
To obtain the 3 kg of pulp needed for 4 kg of raisins, 30 kg of natural grapes are required.

Quick Tip

In problems involving dehydration or concentration changes, identify the component that remains constant (the solute or solid part). Set up your equations based on the quantity of this constant component.

3. A dishonest shopkeeper uses faulty weights while selling goods. He uses a fake 1kg weight that weighs 800gms and marks the price up by 20%. If 25% of the goods he received were defective, by how many percentage points should he increase the markup percentage so that the profit percentage remains unaffected?

(A) 20
(B) 40
(C) 10
(D) 75
(E) 25

Correct Answer: (B) 40

Solution:

Step 1: Understanding the Concept:
This is a multi-step profit and loss problem involving faulty weights, markups, and defective goods. We first need to calculate the original profit percentage and then find the new markup required to maintain it under new conditions.

Step 2: Detailed Explanation:
Let's assume the Cost Price (CP) of 1000 gm of goods is $100.

Part 1: Calculate the original profit percentage.

- **Markup:** The shopkeeper marks the price up by 20%.

$$\text{Marked Price (MP) of 1000 gm} = \$100 \times (1 + 0.20) = \$120$$

- **Faulty Weight:** He uses an 800 gm weight to sell 1 kg. So, when a customer buys "1 kg", they are actually getting 800 gm.

- **Revenue:** The selling price (SP) for 800 gm is the MP of 1000 gm, which is $120.

- **Cost:** The cost of the 800 gm he sells is $\frac{800}{1000} \times \$100 = \$80$.

- **Profit:** Profit = SP - CP = $120 - $80 = $40.

- **Profit Percentage:**

$$\text{Profit \%} = \left(\frac{\text{Profit}}{\text{CP}}\right) \times 100 = \left(\frac{\$40}{\$80}\right) \times 100 = 50\%$$

So, the original profit percentage is 50%.

Part 2: Calculate the new markup with defective goods.

- **Defective Goods:** 25% of the goods are defective. This means for every 1000 gm he buys for $100, only 750 gm are sellable.

- **Effective Cost:** His effective cost for 750 gm of sellable goods is $100.

- **Goal:** He wants to maintain a 50% profit on this effective cost.

$$\text{Target Profit} = 50\% \text{ of } \$100 = \$50$$

$$\text{Target Revenue} = \text{Effective Cost} + \text{Target Profit} = \$100 + \$50 = \$150$$

- He must generate $150 in revenue by selling the 750 gm of good stock, using his 800 gm fake weight. Let the new markup be $m\%$.

- **New Marked Price (MP') of 1000 gm** $= \$100 \times (1 + \frac{m}{100})$.

- The revenue from selling 800 gm is MP'. So the revenue from 1 gm is $\frac{\text{MP'}}{800}$.

- The total revenue he can get from his 750 gm of goods is:

$$\text{Total Revenue} = 750 \times \left(\frac{\text{MP'}}{800} \right) = 750 \times \left(\frac{\$100 \times (1 + \frac{m}{100})}{800} \right)$$

- We set this equal to the target revenue of $150.

$$150 = 750 \times \left(\frac{100 \times (1 + \frac{m}{100})}{800} \right)$$

$$150 = \frac{75000}{800} \times (1 + \frac{m}{100})$$

$$150 = 93.75 \times (1 + \frac{m}{100})$$

$$1 + \frac{m}{100} = \frac{150}{93.75} = 1.6$$

$$\frac{m}{100} = 0.6 \implies m = 60\%$$

The new markup percentage needs to be 60%.

Part 3: Find the increase in percentage points. The original markup was 20%. The new markup is 60%.

$$\text{Increase} = 60 - 20 = 40 \text{ percentage points}$$

Step 3: Final Answer:
The shopkeeper needs to increase his markup from 20% to 60%, which is an increase of 40 percentage points.

Quick Tip

For complex profit problems, it's often easiest to assume a base Cost Price (like $100) and work through each condition step-by-step. First, find the baseline profit percentage. Then, adjust the cost and revenue calculations based on the new conditions to find the variable required to meet the baseline profit.

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4. If $25^{3a+5} + 125^{2a+3} = 18750$**, what is the value of a?**

(A) $\frac{2}{3}$
(B) $-\frac{2}{3}$
(C) $\frac{1}{3}$
(D) $-\frac{1}{3}$

Correct Answer: (B) $-\frac{2}{3}$

Solution:

Step 1: Understanding the Concept:
This is an equation involving exponents. The strategy is to express all terms with a common base and then use the properties of exponents to solve for the variable.

Step 2: Key Formula or Approach:
Properties of exponents:

- $(x^m)^n = x^{mn}$

- $x^m \cdot x^n = x^{m+n}$

The common base for 25 and 125 is 5.

Step 3: Detailed Explanation:
First, rewrite the bases in terms of 5:
$$25 = 5^2$$
$$125 = 5^3$$

Substitute these into the original equation:
$$(5^2)^{3a+5} + (5^3)^{2a+3} = 18750$$

Apply the power of a power rule $(x^m)^n = x^{mn}$:
$$5^{2(3a+5)} + 5^{3(2a+3)} = 18750$$
$$5^{6a+10} + 5^{6a+9} = 18750$$

The exponents are very similar. We can factor out the term with the smaller exponent, which is 5^{6a+9}.
$$5^{6a+9}(5^1 + 1) = 18750$$
$$5^{6a+9}(5 + 1) = 18750$$
$$5^{6a+9}(6) = 18750$$

Now, isolate the exponential term by dividing by 6:
$$5^{6a+9} = \frac{18750}{6}$$
$$5^{6a+9} = 3125$$

To solve for a, we need to express 3125 as a power of 5.

$$5^1 = 5$$
$$5^2 = 25$$
$$5^3 = 125$$
$$5^4 = 625$$
$$5^5 = 3125$$

So, the equation becomes:
$$5^{6a+9} = 5^5$$

Since the bases are equal, we can equate the exponents:
$$6a + 9 = 5$$
$$6a = 5 - 9$$
$$6a = -4$$
$$a = -\frac{4}{6} = -\frac{2}{3}$$

Step 4: Final Answer:
The value of a is $-\frac{2}{3}$.

> **Quick Tip**
>
> When you see an equation with different numerical bases that are powers of the same number (like 2, 4, 8, 16 or 3, 9, 27), the first step is always to convert everything to that common base. Then look for opportunities to factor.

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5. In an increasing sequence of 6 consecutive odd integers, the sum of the second, third, fourth, and fifth integers is 192. What is the sum of the first and last integers?

(A) 88
(B) 92
(C) 96
(D) 100
(E) 104

Correct Answer: (C) 96

Solution:

Step 1: Understanding the Concept:
This problem deals with arithmetic sequences, specifically a sequence of consecutive odd integers. Consecutive odd integers differ by 2.

Step 2: Key Formula or Approach:
For a set of numbers in an arithmetic sequence, the mean is equal to the median. Also, the sum of the terms is the number of terms multiplied by the mean.

Step 3: Detailed Explanation:
Method 1: Using the Mean We are given that the sum of four consecutive odd integers (the 2nd, 3rd, 4th, and 5th terms of the sequence) is 192. Let's find the average of these four integers:

$$\text{Average} = \frac{\text{Sum}}{\text{Number of terms}} = \frac{192}{4} = 48$$

Since these are consecutive odd integers, their average (48) will lie exactly in the middle of the set. The four integers must be the two odd integers immediately below 48 and the two odd integers immediately above 48. The two odd integers around 48 are 47 and 49. So, the four integers are 45, 47, 49, and 51. These are the second, third, fourth, and fifth terms of the full sequence of six consecutive odd integers.

- Second term = 45
- Third term = 47
- Fourth term = 49
- Fifth term = 51

To find the first term, we subtract 2 from the second term: $45 - 2 = 43$. To find the last (sixth) term, we add 2 to the fifth term: $51 + 2 = 53$. The full sequence is: 43, 45, 47, 49, 51, 53. The question asks for the sum of the first and last integers.

$$\text{Sum} = 43 + 53 = 96$$

Method 2: Using Algebra Let the six consecutive odd integers be represented by: $n, n + 2, n + 4, n + 6, n + 8, n + 10$ The sum of the second, third, fourth, and fifth integers is 192:

$$(n + 2) + (n + 4) + (n + 6) + (n + 8) = 192$$
$$4n + 20 = 192$$
$$4n = 172$$
$$n = \frac{172}{4} = 43$$

The first integer is $n = 43$. The last integer is $n + 10 = 43 + 10 = 53$. The sum of the first and last integers is $43 + 53 = 96$.

Step 4: Final Answer:
The sum of the first and last integers is 96.

Quick Tip

For any arithmetic sequence, the sum of any two terms equidistant from the center is the same. For example, in this sequence, 1st + 6th = 2nd + 5th = 3rd + 4th. Since we found the 2nd (45) and 5th (51) terms, their sum is 96, which must also be the sum of the 1st and 6th terms.

6. Suppose the probability of a surprise test on any given day is 50 per cent. What is the probability that there are exactly 2 surprise tests in a 6-day period?

(A) $\frac{5}{32}$
(B) $\frac{3}{16}$
(C) $\frac{7}{32}$
(D) $\frac{15}{64}$
(E) $\frac{9}{32}$

Correct Answer: (D) $\frac{15}{64}$

Solution:

Step 1: Understanding the Concept:
This is a problem of binomial probability. We have a fixed number of independent trials (6 days), each with two possible outcomes (test or no test), and the probability of success is constant for each trial.

Step 2: Key Formula or Approach:
The binomial probability formula is:

$$P(X = k) = C(n, k) \cdot p^k \cdot q^{n-k}$$

Where:

- n is the total number of trials.

- k is the exact number of successful outcomes.

- p is the probability of success on a single trial.

- q is the probability of failure on a single trial ($q = 1 - p$).

- $C(n, k)$ is the number of combinations, calculated as $\frac{n!}{k!(n-k)!}$.

Step 3: Detailed Explanation:
From the problem statement:

- Number of trials, $n = 6$ (a 6-day period).

- Exact number of successes, $k = 2$ (exactly 2 surprise tests).

- Probability of success (a test), $p = 50\% = 0.5 = \frac{1}{2}$.

- Probability of failure (no test), $q = 1 - 0.5 = 0.5 = \frac{1}{2}$.

First, calculate the number of ways to choose 2 days out of 6 for the tests, $C(6, 2)$:

$$C(6, 2) = \frac{6!}{2!(6 - 2)!} = \frac{6!}{2!4!} = \frac{6 \times 5}{2 \times 1} = 15$$

There are 15 different combinations of 2 test days in a 6-day period.

Next, calculate the probability for any one of these specific combinations. For example, tests on the first two days and no tests on the next four (TTNNNN):

$$P(\text{one combination}) = p^k \cdot q^{n-k} = \left(\frac{1}{2}\right)^2 \cdot \left(\frac{1}{2}\right)^4 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

Finally, multiply the number of combinations by the probability of one combination:

$$P(\text{exactly 2 tests}) = C(6,2) \times P(\text{one combination}) = 15 \times \frac{1}{64} = \frac{15}{64}$$

Step 4: Final Answer:
The probability of having exactly 2 surprise tests in a 6-day period is $\frac{15}{64}$.

> **Quick Tip**
>
> Recognize the keywords for a binomial probability problem: a fixed number of trials, independent trials, only two outcomes per trial, and a constant probability of success. When $p = q = 1/2$, the formula simplifies to $C(n,k)/2^n$.

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7. In a set of 5 observations 3, 5, 9, 12, 14, one more observation is added, such that the new mean of the set is equal to the new median. If the added observation is not equal to any of the previous observations, how many positive integral values of the new observation are possible?

(A) 5
(B) 4
(C) 3
(D) 2
(E) 1

Correct Answer: (E) 1

Solution:

Step 1: Understanding the Concept:
This problem combines concepts of mean and median. We need to analyze how adding a new value x affects both measures and find the values of x that make them equal.

Step 2: Detailed Explanation:
The original set of 5 observations is 3, 5, 9, 12, 14. The sum of these observations is $3 + 5 + 9 + 12 + 14 = 43$.
A new observation, x, is added. The new set has 6 observations.

- **New Mean:** The new sum is $43 + x$. The new mean is $\frac{43+x}{6}$.

- **New Median:** The new set has 6 observations. The median will be the average of the 3rd and 4th terms once the set is sorted. The value of the median depends on where x falls in relation to the original numbers.

We need to solve the equation: New Mean = New Median, or $\frac{43+x}{6}$ = New Median.

Let's test the possible cases for the position of x. **Case 1: x is smaller than the middle values (x ¡ 9).** The original sorted set is 3, 5, 9, 12, 14. If we add an $x < 9$, the two middle terms of the new sorted set will be 5 and 9.

- New Median = $\frac{5+9}{2} = 7$.
- Set mean equal to median: $\frac{43+x}{6} = 7$.
- Solve for x: $43 + x = 42 \implies x = -1$.
- This value is not a positive integer, so it is not a valid solution.

Case 2: x is between the two original middle values (9 ¡ x ¡ 12). If we add an x in this range, the new sorted set is 3, 5, 9, x, 12, 14. The two middle terms are 9 and x.

- New Median = $\frac{9+x}{2}$.
- Set mean equal to median: $\frac{43+x}{6} = \frac{9+x}{2}$.
- Solve for x: $43 + x = 3(9 + x) \implies 43 + x = 27 + 3x$.
- $16 = 2x \implies x = 8$.
- This value $x = 8$ contradicts the condition for this case (9 ¡ x ¡ 12). So, there is no solution in this range.

Case 3: x is larger than the middle values (x ¿ 12). If we add an $x > 12$, the two middle terms of the new sorted set will be 9 and 12.

- New Median = $\frac{9+12}{2} = 10.5$.
- Set mean equal to median: $\frac{43+x}{6} = 10.5$.
- Solve for x: $43 + x = 6 \times 10.5 \implies 43 + x = 63$.
- $x = 20$.
- This value is a positive integer, it's not equal to any of the original observations, and it satisfies the condition for this case ($x > 12$). This is a valid solution.

Step 3: Final Answer:
We have analyzed all possible cases and found only one possible positive integral value for the new observation, which is 20. Therefore, there is only 1 possible value.

Quick Tip

When a problem involves finding a value that affects the median, you must break the problem down into cases based on where the unknown value could fall within the sorted list. Be systematic to ensure you cover all possibilities.

8. All of the following statements are true according to the passage EXCEPT

(A) Deep learning has contributed to the convergence of methodologies in various computer science fields.
(B) Multimodal models can leverage visual and sensory context to enhance understanding.
(C) Language-only models have a limitless capacity to process and comprehend text data.
(D) The integration of multimodal models in AI can lead to a more comprehensive understanding of the world.
(E) Multimodal models address the limitations of language-only models by incorporating different modalities.

Correct Answer: (C) Language-only models have a limitless capacity to process and comprehend text data.

Solution:

Step 1: Understanding the Concept:
This is an "EXCEPT" question. We must identify the one statement that is most likely false or not mentioned, based on the inferred content of the passage. The other four statements are likely to be true according to the passage.

Step 2: Reconstructing the Passage's Argument:
Based on the other options, the passage likely argues the following:

- Deep learning is a unifying technology (A).

- Multimodal models are an advance over language-only models (E).

- They achieve this by using visual and sensory data (B) to get a more comprehensive understanding of the world (D).

These points form a coherent argument in favor of multimodal AI.

Step 3: Detailed Explanation:
Let's evaluate each option in light of this reconstructed argument.

- (A), (B), (D), (E): These four statements work together to build a consistent argument about the benefits of multimodal AI. It is highly probable that a passage on this topic would make these claims.

- (C): This statement claims that language-only models have a "limitless capacity." The word "limitless" is an extreme, absolute term. Technical and scientific passages are typically nuanced and focus on both the capabilities and the limitations of a technology. It is highly improbable that the author would describe any current technology, especially one being compared to a more advanced alternative, as having "limitless capacity." The passage's purpose is likely to highlight the *limits* of language-only models, which multimodal approaches overcome.

Step 4: Final Answer:
The claim that language-only models have "limitless capacity" is an extreme and unrealistic assertion that contradicts the likely theme of the passage, which is about the limitations of such models. Therefore, this is the statement that would not be true according to the passage.

> **Quick Tip**
>
> In "EXCEPT" questions, be highly suspicious of answer choices that contain extreme words like "all," "never," "always," "only," or, in this case, "limitless." Nuanced passages rarely make such absolute claims.

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9. Which of the following accurately describes the central problem that a multimodal approach can solve, according to the author?

(A) Language-only models struggle to comprehend the nuances of natural language.
(B) Language-only models fail to generate fluent and coherent content.
(C) Language-only models face challenges in accurately extrapolating data to derive meaningful insights.
(D) Language-only models lack the ability to integrate data from various sources.
(E) Language-only models have a limited capacity to process and understand the physical world.

Correct Answer: (E) Language-only models have a limited capacity to process and understand the physical world.

Solution:

Step 1: Understanding the Concept:
This question asks for the central problem that multimodal AI is designed to solve. Based on the other questions, the passage contrasts language-only models with multimodal models that incorporate "visual and sensory context."

Step 2: Detailed Explanation:
The key difference highlighted is the type of data each model uses. Language-only models are confined to text. Multimodal models add other data types, specifically visual and sensory data, which are our primary means of perceiving the physical world. Therefore, the central problem that this addition of data solves must be the "unworldliness" of a system that only knows text.

- (A) & (B): Modern language models are actually very good at comprehending nuances and generating fluent content. This is unlikely to be the "central problem."

- (C) & (D): These are too general. While multimodal models do integrate data from various sources, this doesn't capture the specific nature of the problem being solved. The key is *what kind* of data is being integrated.

- (E): This is the most accurate answer. The limitation of a text-only system is its lack of "grounding" in reality. It doesn't see, hear, or touch. By adding visual and sensory

data, a multimodal approach directly addresses a language-only model's limited capacity to understand the physical world.

Step 3: Final Answer:
The core advantage of adding visual and sensory data (multimodality) is to connect the AI's understanding to the real, physical world, overcoming the primary limitation of a model that only processes abstract text.

> **Quick Tip**
>
> To identify the "central problem" a solution addresses, focus on the most fundamental difference between the "before" and "after" states. Here, the change is from "text only" to "text + senses," so the problem being solved must relate to the absence of sensory input.

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10. The claim in the boldfaced portion can be supported if it is proven that

(A) Multimodal models have been shown to outperform language-only models in generating realistic and contextually coherent narratives.
(B) Deep learning techniques have facilitated the integration of computer vision and robotics, enabling more accurate fabrication of physical objects.
(C) Multimodal models can process and understand sensory inputs, allowing them to detect data fabrication.
(D) The finite amount of text available on the internet limits the extent to which language-only models can fabricate information.
(E) The practical motivation for adopting multimodal approaches includes enhancing the accuracy and reliability of data fabrication in AI systems.

Correct Answer: (C) Multimodal models can process and understand sensory inputs, allowing them to detect data fabrication.

Solution:
Note: The boldfaced portion of the passage is missing. However, the answer choices strongly suggest the claim was about "data fabrication" (a term for AI generating false information or "hallucinating"). A plausible claim would be: **"Multimodal AI offers a potential solution to the problem of data fabrication."** This solution assumes such a claim was made.

Step 1: Understanding the Concept:
This is a "strengthen the argument" question. We need to find a piece of evidence that would provide the best support for the assumed claim about multimodal models and data fabrication.

Step 2: Detailed Explanation:
If the claim is that multimodal models can help with data fabrication, we need an answer that explains the mechanism by which they could do this. How could a model with vision and other senses be better at detecting false information? It could cross-reference information from

different modalities. For example, if a text claims "The Eiffel Tower is blue," a multimodal model could check that claim against an image of the Eiffel Tower.

- (A) This is about generating narratives, not detecting fabrication.

- (B) This is about fabricating physical objects, a different meaning of the word "fabrication."

- (C) This is the correct answer. It provides the specific mechanism. By processing sensory inputs (e.g., seeing an image, hearing a sound), the model can check textual claims against real-world data, allowing it to "detect data fabrication." This directly supports the idea that multimodality helps solve the problem.

- (D) This discusses a limitation of language-only models but doesn't explain how multimodal models are better.

- (E) This restates the claim as a "practical motivation" but doesn't provide supporting evidence for *how* it would work.

Step 3: Final Answer:
Assuming the claim is about multimodal AI helping to solve data fabrication, option (C) provides the strongest support by explaining the mechanism: using sensory inputs to verify information and detect falsehoods.

> **Quick Tip**
>
> In "strengthen" questions, look for an answer choice that provides a "how" or "why." A choice that explains the mechanism by which a proposed solution would work is often the strongest form of support.

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11. The passage implies that the convergence of deep learning techniques across computer science fields has had what effect?

(A) It has resulted in a significant increase in the size and complexity of language-only models.
(B) It has made it easier to integrate models from different domains into multimodal systems.
(C) It has caused a decline in the importance of natural language processing in AI research.
(D) It has rendered the use of computer vision and robotics obsolete in deep learning applications.
(E) It has led to a reduction in the overall computational power required for training AI models.

Correct Answer: (B) It has made it easier to integrate models from different domains into multimodal systems.

Solution:

Step 1: Understanding the Concept:
This is an implication question asking about the effect of "convergence of deep learning techniques." The passage's main topic is multimodality, which is the integration of different AI

domains (language, vision, etc.). The question connects deep learning to this central theme.

Step 2: Detailed Explanation:
"Convergence" means things are coming together. If deep learning techniques are converging across fields like natural language processing and computer vision, it means these fields are starting to use similar underlying methods and architectures. When different fields use a common technological foundation, it becomes much easier to combine them. Therefore, the convergence of deep learning techniques would logically be the enabler of multimodal systems, which are, by definition, an integration of models from different domains.

- (A) This focuses only on language-only models, while the passage seems to be about the shift *towards* multimodality.

- (B) This is the correct answer. The convergence of underlying techniques (deep learning) is what makes the integration of different applications (language, vision) into a single multimodal system possible or easier.

- (C) & (D): Convergence would make these fields *more* important as components of larger systems, not less important or obsolete.

- (E) This is highly unlikely. Deep learning and the integration of large models are known to be computationally intensive, so a reduction in required power would not be a logical effect.

Step 3: Final Answer:
The convergence of deep learning provides a common technical language for different AI fields, which has the direct effect of making it easier to integrate them into complex multimodal systems.

> **Quick Tip**
>
> Think about the literal meaning of words in the question. "Convergence" means coming together. "Multimodal" means having multiple modes (e.g., vision, language). It is logical to infer that the coming together of the underlying technology would enable the coming together of the applications.

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12. The music industry often claims to suffer significant financial losses due to illegal downloading and piracy. However, some industry experts argue that these estimates are greatly exaggerated and that the actual loss to the music industry is much smaller than projected because...

Which of the following best completes the passage below?

(A) the total market value of pirated music is 30% of the total revenue generated by the music industry

(B) the music industry would still face financial challenges even if it managed to eliminate all instances of online piracy

(C) the majority of people who download music illegally would not purchase it legally even if there were no piracy

(D) many individuals who engage in online piracy do not actively listen to the pirated music

(E) only a small fraction of available music is frequently pirated, whereas the majority remains unaffected by piracy

Correct Answer: (C) the majority of people who download music illegally would not purchase it legally even if there were no piracy

Solution:

Step 1: Understanding the Concept:
This is a Critical Reasoning "complete the argument" question. We need to find the answer choice that provides the most logical reason to support the experts' claim that the actual financial loss from piracy is smaller than the projected estimates.

Step 2: Detailed Explanation:
The Discrepancy: Music industry's projected loss vs. experts' claim of a much smaller actual loss.
The Implied Flaw: The industry's large loss estimates are likely based on a simple, flawed assumption: that every illegal download represents one lost sale. (Projected Loss = Number of Downloads × Price per Album/Song).
The Task: We need to find a reason that challenges this flawed assumption. The reason should explain why an illegal download does not necessarily equal a lost sale.
Let's analyze the options:

- (A) This provides a statistic but doesn't explain the underlying reason for the discrepancy. A loss equivalent to 30% of total revenue could still be considered very significant.

- (B) This discusses other financial challenges and is irrelevant to calculating the specific loss caused by piracy.

- (C) This is the correct answer. It directly attacks the "one download = one lost sale" assumption. If the people who download illegally would not have bought the music anyway, then the industry has not "lost" a sale from their actions. This would mean the actual financial damage is much smaller than the number of downloads would suggest.

- (D) Whether the person listens to the music is irrelevant to the financial loss. The act of acquiring it without payment is the core issue.

- (E) This discusses the scope of piracy (which music gets pirated), not the financial impact of the piracy that does occur. The industry's loss calculation is based on the songs that *are* pirated, so this point is irrelevant.

Step 3: Final Answer:
The argument that the actual loss is smaller than projected is best supported by the reason that most illegal downloaders are not potential customers in the first place. If they wouldn't buy the music legally, then their downloading does not constitute a lost sale.

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13. Studies have shown that countries experiencing currency depreciation often see an increase in exports and a decrease in imports. This phenomenon can be attributed to the fact that a weaker currency makes domestic goods relatively cheaper for foreign buyers while making foreign goods relatively more expensive for domestic consumers. However, not all countries experiencing currency depreciation witness the same level of impact on their trade balance. Analysis of data from various countries reveals that nations with a larger share of export-driven economies tend to benefit more from currency depreciation compared to those with a higher reliance on imported goods. Which of the following conclusions can be properly drawn from the information provided above?

(A) Countries heavily reliant on exports are immune to the effects of currency depreciation on their trade balance.

(B) Currency depreciation could lead to a decrease in both exports and imports for some countries.

(C) The impact of currency depreciation on a country's trade balance depends on its trade composition and reliance on imports.

(D) Countries with a larger share of export-driven economies are more likely to experience currency appreciation rather than depreciation.

(E) Currency depreciation has a significant impact on a country's trade balance, regardless of its reliance on imports or exports.

Correct Answer: (C) The impact of currency depreciation on a country's trade balance depends on its trade composition and reliance on imports.

Solution:

Step 1: Understanding the Concept:
This is an inference question. We need to identify the conclusion that is best supported by the facts presented in the passage. The correct answer should be a direct, logical consequence of the information given.

Step 2: Detailed Explanation:
Let's summarize the key points of the passage:

- **General Rule:** Currency depreciation typically increases exports and decreases imports.

- **Qualification:** "However, not all countries... witness the same level of impact."

- **Specific Finding:** The effect is different for export-driven economies versus import-reliant economies.

The main thrust of the passage is to start with a general economic principle and then refine it by showing that its effect is variable and depends on the specific economic structure of a country.

Let's evaluate the options:

- (A) "Immune" is too strong. The passage says export-reliant countries "benefit more," not that they are completely unaffected or immune.

- (B) This contradicts the passage, which states that depreciation leads to an *increase* in exports.

- (C) This is a perfect summary of the passage's main point. The "trade composition" (the mix of exports and imports) and "reliance on imports" are precisely the factors the passage identifies as determining the impact of currency depreciation.

- (D) The passage discusses the *effects* of currency depreciation, not what causes it or makes it more likely. This is outside the scope of the text.

- (E) This directly contradicts the central point of the passage, which is that the impact is *not* the same for everyone and *does* depend on the reliance on imports and exports.

Step 3: Final Answer:
The passage explicitly states that the impact of currency depreciation varies and that this variation is related to whether a country's economy is driven by exports or reliant on imports. Option (C) accurately captures this conclusion.

> **Quick Tip**
>
> In inference questions, look for an answer choice that accurately synthesizes the main points of the passage without going beyond the information provided. Be wary of extreme words like "all," "never," or "immune."

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14. Scholar: A newly discovered manuscript attributed to William Shakespeare must have been written after 1600 but before 1605. We believe it cannot have been written earlier than 1600 because it references a historical event that occurred in that year, and it cannot have been written after 1605 because it contains a reference to a play that was first performed in that year. Which of the following is an assumption on which the argument depends?

(A) No copies of the referenced play were available to Shakespeare after 1605.
(B) Shakespeare did not revise or edit his manuscripts extensively.
(C) The referenced event in 1600 was widely known and documented at the time.
(D) The ink used in the manuscript can be accurately dated.
(E) Shakespeare's writing style did not change between 1600 and 1605.

Correct Answer: (B) Shakespeare did not revise or edit his manuscripts extensively.

Solution:

Step 1: Understanding the Concept:
This is an assumption question. The scholar's argument uses internal evidence (references to events and a play) to assign a date range to an entire manuscript. We need to identify the unstated premise that is necessary for this method of dating to be valid.

Step 2: Detailed Explanation:
The Argument:

- **Evidence 1:** Reference to a 1600 event → Dates the manuscript to post-1600.

- **Evidence 2:** Reference to a 1605 play → Dates the manuscript to pre-1605. (Note: The logic here is strange as written, but we must work with the scholar's reasoning. The scholar uses the 1605 reference to set an upper bound).

- **Conclusion:** The entire manuscript was written between 1600 and 1605.

The Logical Gap/Assumption: The scholar's method of dating the entire work based on specific references is only valid if the entire work was written at one time. What if Shakespeare wrote the main text in, for example, 1599, and then in 1606 went back and added references to both the 1600 event and the 1605 play? In that case, the references would not accurately date the original composition. Therefore, the scholar must assume that the manuscript is a unified piece, not subject to later additions or revisions.
Let's evaluate the options:

- (A) This is not a necessary assumption for the scholar's argument as stated.

- (B) This is the correct answer. The argument's validity depends on the idea that the references are contemporary with the original writing of the entire manuscript. If Shakespeare could have added these references years after the initial composition, the dating method falls apart. The scholar must assume the manuscript was not revised later.

- (C) This strengthens the reliability of the first piece of evidence but isn't a necessary assumption for the overall argument structure, which relies on both pieces of evidence dating the entire work.

- (D) This provides an alternative method of dating; it does not support the scholar's argument based on internal references.

- (E) The scholar is using content-based dating, not stylistic analysis. Therefore, an assumption about unchanging style is not required for this particular argument.

Step 3: Final Answer:
The scholar's method of dating the entire manuscript based on specific internal references is only logical if one assumes the manuscript was created as a single, unified work at a specific time and not edited or added to later.

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15. Evaluate the problem, and the two statements - labelled (1) and (2) - that contain certain data or information. Using the given statements, decide whether the information provided is sufficient to answer the question.
Abhay started a bike ride from his house at 10:00 AM and rode to a nearby park. He immediately turned around and rode back home, not stopping once during the journey. Did Abhay make it back home by 10:40 AM?
Statement 1: Abhay's average speed while riding back home was 10% slower than his average speed while riding to the park.
Statement 2: Abhay arrived at the park at 10:18 AM.

(A) Statement (1) ALONE is sufficient, but Statement (2) alone is not sufficient
(B) Statement (2) ALONE is sufficient, but Statement (1) alone is not sufficient.
(C) Both Statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
(D) EACH statement ALONE is sufficient
(E) Statements (1) and (2) TOGETHER are NOT sufficient

Correct Answer: (C) Both Statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.

Solution:

Step 1: Understanding the Concept:
This is a Data Sufficiency problem involving time, speed, and distance. The question is a "Yes/No" question. To be sufficient, the information must lead to a definite "Yes" or a definite "No" answer. The question asks if the total journey time was less than or equal to 40 minutes (from 10:00 AM to 10:40 AM).

Step 2: Key Formula or Approach:
Let D be the distance from the house to the park. Let T_1 and S_1 be the time taken and average speed while going to the park. Let T_2 and S_2 be the time taken and average speed while returning home. Total time for the journey $= T_1 + T_2$. The question is: Is $T_1 + T_2 \leq 40$ minutes?

Step 3: Detailed Explanation:
Analyze Statement (1): Abhay's average speed while riding back home was 10% slower than his average speed while riding to the park.
This means $S_2 = S_1 \times (1 - 0.10) = 0.9 \times S_1$. Since the distance is the same for both legs of the journey (D), and $T = D/S$, we can establish a relationship between the times:

$$ T_2 = \frac{D}{S_2} = \frac{D}{0.9 \times S_1} = \frac{1}{0.9} \times \frac{D}{S_1} = \frac{10}{9} \times T_1 $$

The total time is $T_1 + T_2 = T_1 + \frac{10}{9}T_1 = \frac{19}{9}T_1$. The question becomes: Is $\frac{19}{9}T_1 \leq 40$?
We do not know the value of T_1. If $T_1 = 18$ minutes, total time is $\frac{19}{9} \times 18 = 38$ minutes (Yes). If $T_1 = 20$ minutes, total time is $\frac{19}{9} \times 20 \approx 42.2$ minutes (No). Statement (1) alone is not sufficient.

Analyze Statement (2): Abhay arrived at the park at 10:18 AM.
Since he started at 10:00 AM, the time to get to the park, T_1, is 18 minutes. The total time is $18 + T_2$. The question is: Is $18 + T_2 \leq 40$, or is $T_2 \leq 22$? We have no information about his speed on the return trip, so we don't know T_2. It could be less than or greater than 22 minutes. Statement (2) alone is not sufficient.

Analyze Both Statements Together:
From Statement (2), we know $T_1 = 18$ minutes. From Statement (1), we know the relationship $T_2 = \frac{10}{9}T_1$. We can now calculate the exact value of T_2:

$$T_2 = \frac{10}{9} \times 18 = 10 \times 2 = 20 \text{ minutes}$$

The total journey time is $T_1 + T_2 = 18 + 20 = 38$ minutes. Is the total time of 38 minutes less than or equal to 40 minutes? Yes. Since we have a definite "Yes" answer, the statements together are sufficient.

> **Quick Tip**
>
> In Data Sufficiency time-speed-distance problems, focus on what variables you can solve for. Statement 1 gives a relationship between speeds (and thus times), but no actual values. Statement 2 gives an actual value for one part of the journey. Combining them allows you to use the relationship from (1) with the value from (2) to solve the entire problem.

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16. Evaluate the problem, and the two statements - labelled (1) and (2) - that contain certain data or information. Using the given statements, decide whether the information provided is sufficient to answer the question.
The graph shows the number of covid cases in a village in Madhya Pradesh in the years 2020 and 2021. What is the ratio of the difference between omicron and delta cases in the year 2020 to that in the year 2021? Variants A, B, and C are one of omicron, delta and beta variants, not necessarily in the same order.
(The graph is a stacked bar chart showing cases for Variants A, B, and C in 2020 and 2021).
(1) The number of cases of Beta and delta together in 2020 is 3000.
(2) The number of cases of Omicron and beta together in 2021 is 6000.

(A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
(D) EACH statement ALONE is sufficient.
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

Correct Answer: (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.

Solution:

Step 1: Understanding the Concept:
This is a Data Sufficiency problem that requires interpreting a stacked bar chart and using logical deduction to identify the variants. The goal is to find a specific ratio, which requires uniquely identifying the Omicron and Delta variants.

Step 2: Read the Data from the Graph:
By observing the stacked bars:

- **For 2020:**
    - Variant A (blue) = 7000
    - Variant B (orange) = 9000 - 7000 = 2000
    - Variant C (grey) = 10000 - 9000 = 1000

- **For 2021:**
    - Variant A (blue) = 4000
    - Variant B (orange) = 7000 - 4000 = 3000
    - Variant C (grey) = 9000 - 7000 = 2000

Let O, D, B be the number of cases for Omicron, Delta, and Beta respectively. We need to find the value of $\frac{|O_{2020} - D_{2020}|}{|O_{2021} - D_{2021}|}$.

Step 3: Detailed Explanation:
Analyze Statement (1): The number of cases of Beta and Delta together in 2020 is 3000. The 2020 values are 7000, 2000, 1000. The two values that sum to 3000 are 2000 and 1000. This means {Beta, Delta} corresponds to {Variant B, Variant C}. The remaining variant, Variant A (7000 cases), must be Omicron. So, we know $O_{2020} = 7000$. However, we don't know if Delta is Variant B (2000) or Variant C (1000).

- If Delta = B, then $|O_{2020} - D_{2020}| = |7000 - 2000| = 5000$.

- If Delta = C, then $|O_{2020} - D_{2020}| = |7000 - 1000| = 6000$.

Since we cannot find a unique value for the numerator of the ratio, Statement (1) is not sufficient.

Analyze Statement (2): The number of cases of Omicron and Beta together in 2021 is 6000. The 2021 values are 4000, 3000, 2000. The two values that sum to 6000 are 4000 and 2000. This means {Omicron, Beta} corresponds to {Variant A, Variant C}. The remaining variant, Variant B (3000 cases), must be Delta. So, we know $D_{2021} = 3000$ and $D_{2020} = 2000$. However, we don't know if Omicron is Variant A or Variant C.

- If Omicron = A, then $|O_{2020} - D_{2020}| = |7000 - 2000| = 5000$ and $|O_{2021} - D_{2021}| = |4000 - 3000| = 1000$. The ratio is 5.

- If Omicron = C, then $|O_{2020} - D_{2020}| = |1000 - 2000| = 1000$ and $|O_{2021} - D_{2021}| = |2000 - 3000| = 1000$. The ratio is 1.

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Since we get two different possible ratios, Statement (2) is not sufficient.

Analyze Both Statements Together:
From (1), we know: Omicron = Variant A. From (2), we know: Delta = Variant B. This uniquely identifies two of the variants. The remaining variant must be Beta, so Beta = Variant C. Now we can calculate the ratio without ambiguity:

- Difference in 2020: $|O_{2020} - D_{2020}| = |A_{2020} - B_{2020}| = |7000 - 2000| = 5000$.

- Difference in 2021: $|O_{2021} - D_{2021}| = |A_{2021} - B_{2021}| = |4000 - 3000| = 1000$.

- Ratio $= \frac{5000}{1000} = 5$.

Since we can find a unique value for the ratio, the statements together are sufficient.

> **Quick Tip**
>
> In complex Data Sufficiency problems with multiple unknowns (like the identities of A, B, and C), treat it like a logic puzzle. Use each statement to narrow down the possibilities. If one statement isn't enough, see if the constraints from the second statement, when combined with the first, eliminate all ambiguity.

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17. Evaluate the problem, and the two statements - labelled (1) and (2) - that contain certain data or information. Using the given statements, decide whether the information provided is sufficient to answer the question.
Is $(w + x)a < (y + z)a$?
Statement 1: $w < y$ and $x < z$
Statement 2: $a < 0$

(A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
(D) EACH statement ALONE is sufficient.
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

Correct Answer: (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.

Solution:

Step 1: Understanding the Concept:
This is a Data Sufficiency question involving inequalities. The key principle to remember is that when you multiply or divide both sides of an inequality by a negative number, you must reverse the inequality sign. The question is a "Yes/No" question.

Step 2: Detailed Explanation:
The question asks if $(w + x)a < (y + z)a$. The answer depends on two things: the relationship between $(w + x)$ and $(y + z)$, and the sign of a.

Analyze Statement (1): $w < y$ and $x < z$.
We can add these two inequalities together:

$$w + x < y + z$$

Now, let's return to the original question: Is $(w + x)a < (y + z)a$? This depends on the sign of a.

- If a is positive (e.g., $a = 2$), then we can divide by a without changing the sign, and the inequality becomes $w + x < y + z$, which we know is true. So the answer is "Yes".

- If a is negative (e.g., $a = -2$), then we must reverse the sign when dividing. The inequality becomes $w + x > y + z$, which we know is false. So the answer is "No".

Since we can get both "Yes" and "No", Statement (1) is not sufficient.

Analyze Statement (2): $a < 0$.
This tells us that a is negative. We can simplify the original inequality by dividing both sides by a and reversing the inequality sign: The question is equivalent to asking: Is $w + x > y + z$? We have no information about the values of w, x, y, and z. We can pick values to make this true or false.

- If $w = 5, x = 5, y = 1, z = 1$, then $10 > 2$. The answer is "Yes".

- If $w = 1, x = 1, y = 5, z = 5$, then $2 > 10$. The answer is "No".

Since we can get both "Yes" and "No", Statement (2) is not sufficient.

Analyze Both Statements Together:
From Statement (1), we know that $w + x < y + z$. From Statement (2), we know that $a < 0$. The question is: Is $(w + x)a < (y + z)a$? Since a is negative, this inequality is true if and only if $w + x > y + z$. However, Statement (1) tells us definitively that $w + x < y + z$. Therefore, the condition $w + x > y + z$ is false. This means the answer to the question "Is $(w + x)a < (y + z)a$" is a definite "No". Since we have a definite "No" answer, the statements together are sufficient.

> **Quick Tip**
>
> When an inequality involves multiplying by a variable (like 'a' here), immediately recognize that you need to know the sign of that variable. Statement 2 provides the sign, and Statement 1 provides the relationship between the other terms. This structure often requires combining both statements for sufficiency.