GMAT Quant Practise Question Paper 4 with Solutions

Time Allowed : 2 hours 15 minutes	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.

GMAT DATA SUFFICIENCY

1. The area of a triangle is equal to the area of the rectangle. Find the perimeter of the rectangle.
1. The perimeter of the square is 24 inches.
2. The sum of the length and the width is 13 inches.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question.

(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

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

Solution:

Step 1: Understanding the Concept:
The question asks for the perimeter of a rectangle. Data Sufficiency questions test whether the given information is enough to arrive at a single, unique answer. We need to evaluate each statement independently and then together.

Step 2: Key Formula or Approach:
The formula for the perimeter of a rectangle is:

$$P = 2 \times (length + width) = 2(l + w)$$

To find the perimeter, we need the sum of the length and the width $(l + w)$.

Step 3: Detailed Explanation:
Analyze Statement (1): "The perimeter of the square is 24 inches."
This statement provides information about a square. However, the initial problem statement does not establish any relationship between this square and the triangle or the rectangle. Knowing the square's perimeter (and thus its side length and area) does not give us any information about the dimensions of the rectangle. Therefore, Statement (1) alone is not sufficient.

Analyze Statement (2): "The sum of the length and the width is 13 inches."
This statement directly gives us the value of $(l + w)$.

$$l + w = 13 \text{ inches}$$

Using the perimeter formula:

$$P = 2(l + w) = 2(13) = 26 \text{ inches}$$

This statement allows us to calculate a unique value for the perimeter of the rectangle. Therefore, Statement (2) alone is sufficient.

Step 4: Final Answer:
Since Statement (2) alone is sufficient and Statement (1) alone is not sufficient, the correct option is (B). The information about the triangle and its area being equal to the rectangle's area is extra information not needed when considering Statement (2).

Quick Tip

In Data Sufficiency, focus only on what you need to answer the question. Here, the goal was the perimeter, which is $2(l + w)$. Statement (2) directly provides $(l + w)$, making it sufficient on its own. Don't get distracted by extra, unrelated information.

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2. A particle moving in air increases its speed within 30 minutes. Find its acceleration.
1. Its initial velocity is 20 miles per hour and its final velocity is 25 miles per hour.
2. The particle increases its speed by 5 miles per hour.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (D) EACH statement ALONE is sufficient to answer the question asked.

Solution:

Step 1: Understanding the Concept:
The question asks for the acceleration of a particle. We are given the time interval. We need to determine if the statements provide enough information about the change in velocity to calculate the acceleration.

Step 2: Key Formula or Approach:
Acceleration is the rate of change of velocity. The formula is:

$$\text{Acceleration}(a) = \frac{\text{Final Velocity}(v) - \text{Initial Velocity}(u)}{\text{Time}(t)} = \frac{\Delta v}{t}$$

From the question, we know the time: $t = 30$ minutes $= 0.5$ hours.
To find the acceleration, we need the change in velocity $(v - u)$.

Step 3: Detailed Explanation:
Analyze Statement (1): "Its initial velocity is 20 miles per hour and its final velocity is 25 miles per hour."
This statement gives us:
$u = 20$ mph
$v = 25$ mph
We can calculate the change in velocity: $\Delta v = v - u = 25 - 20 = 5$ mph.

Now we can find the acceleration:

$$a = \frac{5 \text{ mph}}{0.5 \text{ h}} = 10 \text{ miles/hour}^2$$

This statement provides a unique value for acceleration. Thus, Statement (1) is sufficient.

Analyze Statement (2): "The particle increases its speed by 5 miles per hour."
This statement directly gives us the change in velocity:
$\Delta v = v - u = 5$ mph
We can find the acceleration using this information:

$$a = \frac{\Delta v}{t} = \frac{5 \text{ mph}}{0.5 \text{ h}} = 10 \text{ miles/hour}^2$$

This statement also provides a unique value for acceleration. Thus, Statement (2) is sufficient.

Step 4: Final Answer:
Since each statement alone is sufficient to answer the question, the correct option is (D).

> **Quick Tip**
>
> Recognize that different pieces of information can lead to the same result. Statement (1) gives initial and final velocities, while Statement (2) gives the change in velocity directly. Both allow the calculation of acceleration, making each statement sufficient on its own.

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3. Are the two lines L1 and L2 parallel?
1. Both lines lie in the first, second and fourth quadrants.
2. The y intercepts of the lines L1 and L2 are 8 and 4 respectively.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Solution:

Step 1: Understanding the Concept:
The question asks whether two lines, L1 and L2, are parallel. For two distinct lines to be

parallel, they must have the same slope and different y-intercepts.

Step 2: Key Formula or Approach:
Let the equations of the lines be $y = m_1x + c_1$ for L1 and $y = m_2x + c_2$ for L2.
For L1 and L2 to be parallel:
1. Slopes must be equal: $m_1 = m_2$
2. Y-intercepts must be different: $c_1 \neq c_2$

Step 3: Detailed Explanation:
Analyze Statement (1): "Both lines lie in the first, second and fourth quadrants."
A line that passes through Quadrant I, II, and IV must cross the y-axis at a positive value (to be in I and II) and have a negative slope (to go from II down to I and then IV). So, for both lines, $m < 0$ and $c > 0$. This tells us that both slopes are negative, but not that they are equal. For example, L1 could be $y = -2x+5$ and L2 could be $y = -3x+6$. Both satisfy the condition but are not parallel. Therefore, Statement (1) is not sufficient.

Analyze Statement (2): "The y intercepts of the lines L1 and L2 are 8 and 4 respectively."
This tells us that $c_1 = 8$ and $c_2 = 4$. We know the y-intercepts are different ($c_1 \neq c_2$), which is a necessary condition for two distinct lines to be parallel. However, we have no information about their slopes (m_1 and m_2). The slopes could be equal or unequal. Therefore, Statement (2) is not sufficient.

Analyze Statements (1) and (2) Together:
From (1), we know both lines have negative slopes ($m_1 < 0, m_2 < 0$).
From (2), we know their y-intercepts are 8 and 4.
Combining these, we know that L1 and L2 are two distinct lines with positive y-intercepts and negative slopes. However, we still do not know if their slopes are equal. For example:
Case A (Parallel): L1 is $y = -2x + 8$ and L2 is $y = -2x + 4$. Both satisfy the conditions.
Case B (Not Parallel): L1 is $y = -3x + 8$ and L2 is $y = -2x + 4$. Both also satisfy the conditions.
Since we cannot definitively determine if the lines are parallel, the combined information is not sufficient.

Step 4: Final Answer:
Because even with both statements, we cannot be certain whether the slopes are equal, the information is not sufficient. The correct option is (E).

> **Quick Tip**
>
> For a "Yes/No" Data Sufficiency question, a statement is sufficient only if it always leads to the same answer (always "Yes" or always "No"). If you can find scenarios that satisfy the conditions but give different answers, the information is not sufficient.

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4. s, p and q are interior angles of an Isosceles triangle. Find the value of q.

1. s = 72°.
2. p and q are base angles of the triangle.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (C) BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question ask.

Solution:

Step 1: Understanding the Concept:
The question asks for the value of angle q in an isosceles triangle. An isosceles triangle has two equal sides and two equal base angles. The sum of interior angles in any triangle is 180°.

Step 2: Key Formula or Approach:
1. Sum of angles: $s + p + q = 180$
2. Isosceles property: Two of the three angles must be equal.

Step 3: Detailed Explanation:
Analyze Statement (1): "s = 72°."
This gives us one angle. Since the triangle is isosceles, there are two possibilities for the other angles:
Case A: s is the vertex angle (the unique angle). The other two angles, p and q, are the equal base angles.

$$p = q = \frac{180 - 72}{2} = \frac{108}{2} = 54$$

In this case, q = 54°.
Case B: s is one of the base angles. Then another angle is also 72°. If p is the other base angle, then $p = s = 72$. The third angle would be $q = 180 - 72 - 72 = 36$.
If q is the other base angle, then $q = s = 72$. The third angle would be $p = 180 - 72 - 72 = 36$.
Since q could be 54° or 72° (or 36°, depending on which angle pairs are equal), we cannot find a unique value for q. Thus, Statement (1) is not sufficient.

Analyze Statement (2): "p and q are base angles of the triangle."
This tells us that p and q are the two equal angles in the isosceles triangle. So, $p = q$. The sum of angles is $s + p + q = 180$, which becomes $s + 2q = 180$. Since we do not know the value of s, we cannot find a unique value for q. Thus, Statement (2) is not sufficient.

Analyze Statements (1) and (2) Together:
From (1), we know $s = 72$.

From (2), we know that p and q are the base angles, so $p = q$. This means s must be the vertex angle. We can now substitute the value of s into the equation from our analysis of Statement (2):

$$s + 2q = 180$$
$$72 + 2q = 180$$
$$2q = 180 - 72$$
$$2q = 108$$
$$q = 54$$

This gives a single, unique value for q. Therefore, the statements together are sufficient.

Step 4: Final Answer:
Since neither statement alone is sufficient, but both together are, the correct option is (C).

> **Quick Tip**
>
> When dealing with isosceles triangles, always consider the different cases for which angles are the equal base angles unless specified. Statement (2) is crucial here because it clarifies which angles are the base angles.

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5. Is A an obtuse angle?
1. A is more than 90°.
2. A is a supplement of an angle B, an acute triangle.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (D) EACH statement ALONE is sufficient to answer the question asked.

Solution:

Step 1: Understanding the Concept:
The question is a "Yes/No" question. We need to determine if angle A is obtuse. An obtuse angle is an angle that measures greater than 90° and less than 180°. So, the question is "Is $90 < A < 180$?".

Step 2: Key Formula or Approach:
- Definition of an obtuse angle: An angle θ is obtuse if $90 < \theta < 180$.
- Definition of supplementary angles: Two angles are supplementary if their sum is 180°.
- Definition of an acute angle: An angle ϕ is acute if $0 < \phi < 90$.

Step 3: Detailed Explanation:
Analyze Statement (1): "A is more than 90°."
This statement directly gives the definition of an obtuse angle (assuming A is an angle within a geometric figure, thus < 180). It definitively answers the question with "Yes". Therefore, Statement (1) is sufficient.

Analyze Statement (2): "A is a supplement of an angle B, an acute triangle."
This statement seems to contain a typo and likely means "A is a supplement of angle B, and angle B is an acute angle." Let's proceed with this logical interpretation.
Supplementary angles sum to 180°, so:

$$A + B = 180$$

We are told that B is an acute angle, which means:

$$0 < B < 90$$

We can express A in terms of B:

$$A = 180 - B$$

Since B is less than 90°, A must be greater than 180° - 90°.

$$A > 180 - 90 \implies A > 90$$

Since B is greater than 0°, A must be less than 180° - 0°.

$$A < 180$$

So, we have $90 < A < 180$, which means A is definitively an obtuse angle. This statement answers the question with a "Yes". Therefore, Statement (2) is sufficient.

Step 4: Final Answer:
Since each statement alone is sufficient to definitively answer the question, the correct option is (D).

Quick Tip

In Data Sufficiency, be prepared to interpret minor grammatical errors or typos logically. The phrase "an acute triangle" was likely meant to describe angle B as "an acute angle." Base your reasoning on the most plausible meaning.

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6. Determine the value of angle k.
1. Angle k and m lies on a straight line.
2. Angle m = 39°.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (C) BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question ask.

Solution:

Step 1: Understanding the Concept:
The question asks for a specific numerical value for angle k. We must determine if the given statements provide enough information to find this single value.

Step 2: Key Formula or Approach:
Angles that lie on a straight line are supplementary. This means their sum is 180°.
If k and m are on a straight line, then $k + m = 180$.

Step 3: Detailed Explanation:
Analyze Statement (1): "Angle k and m lies on a straight line."
This tells us the relationship between k and m:

$$k + m = 180$$

However, since the value of m is unknown, we cannot determine the value of k. This is one equation with two variables. Therefore, Statement (1) is not sufficient.

Analyze Statement (2): "Angle m = 39°."
This statement gives us the value of angle m. It provides no information about angle k or its relationship with m. Therefore, Statement (2) is not sufficient.

Analyze Statements (1) and (2) Together:
From Statement (1), we have the equation: $k + m = 180$.
From Statement (2), we have the value: $m = 39$.
We can substitute the value of m from the second statement into the equation from the first statement:

$$k + 39 = 180$$

$$k = 180 - 39$$

$$k = 141$$

This gives a unique value for angle k. Therefore, the two statements together are sufficient.

Step 4: Final Answer:
Since neither statement is sufficient on its own, but they are sufficient when combined, the correct option is (C).

> **Quick Tip**
>
> This is a classic example of a Data Sufficiency problem where two pieces of information, each insufficient on its own, combine to solve a system of equations. Statement (1) provides the equation, and Statement (2) provides a value to plug into it.

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7. A straight line L passes through (2,8) and the origin. Find the equation of a line perpendicular to L.
1. The line passes through the origin.
2. The line passes through (2,-0.5).

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (D) EACH statement ALONE is sufficient to answer the question asked.

Solution:

Step 1: Understanding the Concept:
The question asks for the equation of a line that is perpendicular to a given line L. To find a unique equation for a line, we need its slope and a point on the line.

Step 2: Key Formula or Approach:
1. Slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$.
2. Perpendicular slopes: If a line has slope m, a perpendicular line has a slope of $m_\perp = -\frac{1}{m}$.
3. Point-slope form of a line: $y - y_1 = m(x - x_1)$.

Step 3: Detailed Explanation:
First, let's use the information in the question prompt to find the slope of line L.
Line L passes through the origin (0, 0) and (2, 8).

Slope of L, $m_L = \frac{8-0}{2-0} = \frac{8}{2} = 4$.
The line we are looking for is perpendicular to L. Let its slope be $m_\perp$.
$m_\perp = -\frac{1}{m_L} = -\frac{1}{4}$.
So, we know the slope of the perpendicular line is $-1/4$. Its equation is of the form $y = -\frac{1}{4}x + c$. To find the full equation, we need to find the y-intercept, c, which requires a point on this perpendicular line.

Analyze Statement (1): "The line passes through the origin."
This refers to the perpendicular line. If the perpendicular line passes through the origin (0, 0), we can find c.
Using the point (0, 0) in $y = -\frac{1}{4}x + c$:

$$0 = -\frac{1}{4}(0) + c \implies c = 0$$

The equation of the line is $y = -\frac{1}{4}x$. This is a unique equation. Thus, Statement (1) is sufficient.

Analyze Statement (2): "The line passes through (2,-0.5)."
This also refers to the perpendicular line. We use the point (2, -0.5) to find c.

$$y = -\frac{1}{4}x + c$$
$$-0.5 = -\frac{1}{4}(2) + c$$
$$-0.5 = -0.5 + c \implies c = 0$$

The equation of the line is again $y = -\frac{1}{4}x$. This is a unique equation. Thus, Statement (2) is sufficient.

Step 4: Final Answer:
Since each statement alone provides enough information to determine the unique equation of the perpendicular line, the correct option is (D).

Quick Tip

Always start by extracting all possible information from the question prompt itself before looking at the statements. Here, the slope of the perpendicular line was found from the prompt, which simplified the analysis of the statements.

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8. Two pipes supply waters to a cistern whose capacity of 15 cubic feet. How long does it take the two pipes to fill the cistern?
1. The first pipe supplies water at a rate (per minute) that is thrice faster than the second pipe.
2. The pipes fill 8 cubic feet of the tank in ten minute.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

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

Solution:

Step 1: Understanding the Concept:
This is a work-rate problem. The question asks for the total time required for two pipes working together to fill a cistern of a given capacity.

Step 2: Key Formula or Approach:
The fundamental formula for work-rate problems is:

$$\text{Work} = \text{Rate} \times \text{Time}$$

Or, to find the time:

$$\text{Time} = \frac{\text{Work}}{\text{Rate}}$$

Here, the 'Work' is filling the cistern, which is 15 cubic feet. The 'Rate' is the combined rate of the two pipes. Let r_1 and r_2 be the rates of the first and second pipes, respectively. The combined rate is $R = r_1 + r_2$.
We need to find $T = \frac{15}{r_1+r_2}$.

Step 3: Detailed Explanation:
Analyze Statement (1): "The first pipe supplies water at a rate (per minute) that is thrice faster than the second pipe."
This gives us a relationship between the two rates:

$$r_1 = 3 \times r_2$$

The combined rate is $R = r_1 + r_2 = 3r_2 + r_2 = 4r_2$.
The time to fill the cistern would be $T = \frac{15}{4r_2}$.
Since we don't know the actual value of r_2, we cannot calculate a specific time T. Therefore, Statement (1) is not sufficient.

Analyze Statement (2): "The pipes fill 8 cubic feet of the tank in ten minute."
This statement gives us direct information about the combined rate of the two pipes.
Combined Rate, $R = r_1 + r_2 = \frac{\text{Work}}{\text{Time}} = \frac{8 \text{ cubic feet}}{10 \text{ minutes}} = 0.8$ cubic feet/minute.

Now we can calculate the total time to fill the 15 cubic feet cistern:

$$T = \frac{\text{Total Work}}{\text{Combined Rate}} = \frac{15 \text{ cubic feet}}{0.8 \text{ cubic feet/minute}} = 18.75 \text{ minutes}$$

This gives a unique value for the time. Therefore, Statement (2) is sufficient.

Step 4: Final Answer:
Statement (2) alone is sufficient to answer the question, but Statement (1) alone is not. The correct option is (B).

Quick Tip

In combined work problems, you don't always need to know the individual rates. Knowing the combined rate is often enough to solve the problem, as demonstrated by Statement (2).

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9. Is 2x + 1 > 0.
1. x is an integer
2. $|x| < 1.5$

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Solution:

Step 1: Understanding the Concept:
This is a "Yes/No" Data Sufficiency question involving an inequality. We need to determine if the given conditions are sufficient to conclude definitively whether $2x + 1 > 0$.
First, let's simplify the inequality:
$2x + 1 > 0$
$2x > -1$
$x > -0.5$
So the question is: "Is x greater than -0.5?"

Step 2: Detailed Explanation:

Analyze Statement (1): "x is an integer."

Integers can be greater or less than -0.5.

- If we choose $x = 1$ (an integer), then $1 > -0.5$. The answer is "Yes".
- If we choose $x = -1$ (an integer), then -1 is not greater than -0.5. The answer is "No".

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

Analyze Statement (2): "$|x| < 1.5$."

This inequality means that x is between -1.5 and 1.5.

$$-1.5 < x < 1.5$$

This range contains values that are both greater than and less than -0.5.

- If we choose $x = 1$, then $-1.5 < 1 < 1.5$ is true, and $1 > -0.5$. The answer is "Yes".
- If we choose $x = -1$, then $-1.5 < -1 < 1.5$ is true, but -1 is not greater than -0.5. The answer is "No".

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

Analyze Statements (1) and (2) Together:

We need to find values of x that satisfy both conditions:

1. x is an integer.
2. $-1.5 < x < 1.5$.

The integers that fall within this range are -1, 0, and 1.

Let's test these values for the original question "Is $x > -0.5$?":

- If $x = -1$, is $-1 > -0.5$? No.
- If $x = 0$, is $0 > -0.5$? Yes.
- If $x = 1$, is $1 > -0.5$? Yes.

Even with both statements combined, we can still get a "No" answer (when x=-1) and a "Yes" answer (when x=0 or x=1). Because we cannot arrive at a single, definitive conclusion, the information is not sufficient.

Step 3: Final Answer:

Since even together the statements do not provide a definitive answer, the correct option is (E).

> Quick Tip
>
> For Yes/No questions, test boundary cases and representative numbers within the given constraints. If you find one case that gives a "Yes" and another that gives a "No", the information is insufficient.

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10. Two numbers 12 and t are two positive numbers with some similar properties. What is the value of t.

1. The Least Common Multiple of the two numbers is 48.

2. The Greatest Common multiple of the two numbers is 4.

(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 asked, but NEITHER statement ALONE is sufficient to answer the question ask.
(D) EACH statement ALONE is sufficient to answer the question asked.
(E) Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Correct Answer: (C) BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question ask.

Solution:

Step 1: Understanding the Concept:
The question asks for the specific value of a positive number t, given that the other number is 12. The statements provide information about the Least Common Multiple (LCM) and Greatest Common Divisor (GCD) of 12 and t. Note: "Greatest Common multiple" in statement 2 is a common typo for "Greatest Common Divisor" (GCD).

Step 2: Key Formula or Approach:
For any two positive integers a and b, there is a fundamental relationship between the numbers, their LCM, and their GCD:

$$a \times b = \text{LCM}(a, b) \times \text{GCD}(a, b)$$

In our case, $a = 12$ and $b = t$. So, $12 \times t = \text{LCM}(12, t) \times \text{GCD}(12, t)$.

Step 3: Detailed Explanation:
Analyze Statement (1): "The Least Common Multiple of the two numbers is 48."
We have LCM(12, t) = 48.
Let's use prime factorization. $12 = 2^2 \times 3^1$. $48 = 2^4 \times 3^1$.
The LCM is formed by taking the highest power of each prime factor present in either number.
Let $t = 2^a \times 3^b \times \ldots$.
$\text{LCM}(\ 2^2 \times 3^1, 2^a \times 3^b\ ) = 2^{\max(2,a)} \times 3^{\max(1,b)}$.
This must equal $2^4 \times 3^1$.
So, $\max(2, a) = 4 \implies a = 4$.
And $\max(1, b) = 1 \implies b$ can be 0 or 1.
Possible values for t are: - If b=0, $t = 2^4 = 16$. (Check: LCM(12, 16) = 48. Correct.) - If b=1, $t = 2^4 \times 3^1 = 48$. (Check: LCM(12, 48) = 48. Correct.) Since t could be 16 or 48, Statement (1) is not sufficient.

Analyze Statement (2): "The Greatest Common Divisor of the two numbers is 4."
We have GCD(12, t) = 4.
This means t is a multiple of 4. So $t = 4k$ for some integer k.
Also, t cannot be a multiple of 12 (otherwise the GCD would be 12). The common factors of 12 and t can't include 3.

Possible values for t: - If t = 4, GCD(12, 4) = 4. Possible. - If t = 8, GCD(12, 8) = 4. Possible. - If t = 16, GCD(12, 16) = 4. Possible. - If t = 20, GCD(12, 20) = 4. Possible. There are many possible values for t. Statement (2) is not sufficient.

Analyze Statements (1) and (2) Together:
From (1): LCM(12, t) = 48.
From (2): GCD(12, t) = 4.
Using the formula $a \times b = \text{LCM}(a, b) \times \text{GCD}(a, b)$:

$$12 \times t = 48 \times 4$$
$$12t = 192$$
$$t = \frac{192}{12}$$
$$t = 16$$

This gives a single, unique value for t. Therefore, the statements together are sufficient.

Step 4: Final Answer:
Neither statement alone is sufficient, but combining them provides a unique answer. The correct option is (C).

Quick Tip

Remember the fundamental property connecting two numbers with their LCM and GCD: Product of Numbers = Product of LCM and GCD. This is a powerful tool for this type of question.

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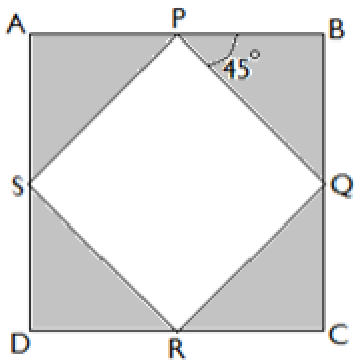
1. A square PQRS is enclosed in another square ABCD. Find the ratio of the area of PQRS to the area of ABCD.



(A) 1/2
(B) 1/4
(C) 1/3

(D) 2/3
(E) $1/\sqrt{2}$

Correct Answer: (A) 1/2

Solution:

Step 1: Understanding the Concept:
We need to find the ratio of the area of an inner square to an outer square. The problem provides a diagram showing the orientation of the inner square. The key is to establish a relationship between the side lengths of the two squares.

Step 2: Key Formula or Approach:
- Area of a square = (side)^2.
- Pythagorean theorem in a right-angled triangle: $a^2 + b^2 = c^2$.
Let the side length of the outer square ABCD be s. The area of ABCD is s^2.
The vertices of the inner square PQRS lie on the sides of the outer square ABCD. This creates four congruent right-angled triangles in the corners (e.g., $\triangle PBQ$).

Step 3: Detailed Explanation:
Let's analyze the corner triangle $\triangle PBQ$. It is a right-angled triangle with the right angle at B. Let $PB = x$ and $BQ = y$. The side of the outer square is $AB = s$. Since Q is on BC, we have $BC = s$. Then $QC = s - y$. Similarly, $AP = s - x$.
Due to the symmetry of a square inscribed in another square, the four corner triangles ($\triangle PBQ, \triangle QCR, \triangle R$
are congruent.
Therefore, $PB = QC = RD = SA = x$ and $BQ = CR = DS = AP = y$.
This gives us $s - y = x$, or $x + y = s$.
The diagram has an angle marked as 45 degrees, which appears to be $\angle BPQ$. In $\triangle PBQ$, we have $\angle PBQ = 90°$. If $\angle BPQ = 45°$, then $\triangle PBQ$ must be an isosceles right-angled triangle, meaning $PB = BQ$.
So, $x = y$.
Since $x + y = s$ and $x = y$, we have $x + x = s \implies 2x = s \implies x = s/2$.
This means the vertices of the inner square are at the midpoints of the sides of the outer square.
Now we find the side length of the inner square, PQ, using the Pythagorean theorem in $\triangle PBQ$:

$$PQ^2 = PB^2 + BQ^2$$
$$PQ^2 = (s/2)^2 + (s/2)^2 = \frac{s^2}{4} + \frac{s^2}{4} = \frac{2s^2}{4} = \frac{s^2}{2}$$

The area of the inner square PQRS is equal to PQ^2.

$$\text{Area(PQRS)} = \frac{s^2}{2}$$

The area of the outer square ABCD is s^2.
The ratio is:

$$\frac{\text{Area(PQRS)}}{\text{Area(ABCD)}} = \frac{s^2/2}{s^2} = \frac{1}{2}$$

Step 4: Final Answer:
The ratio of the area of square PQRS to the area of square ABCD is 1/2.

> **Quick Tip**
>
> When a square is inscribed in another square such that its vertices touch the sides of the outer square, if the corner triangles are isosceles (as indicated by the 45-degree angle), the vertices of the inner square are at the midpoints of the sides of the outer square. The area of such an inscribed square is always half the area of the outer square.

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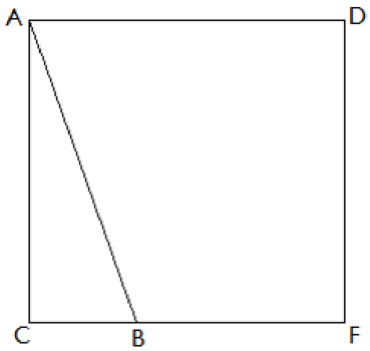
2. What is the ratio of the area of triangle ABC to the area of square ADFC if CB=(CF)/4?



(A) 1/4
(B) 1/8
(C) 1/16
(D) 2/5
(E) 3/8

Correct Answer: (B) 1/8

Solution:

Step 1: Understanding the Concept:
The question asks for the ratio of the area of a triangle to the area of a square. We are given a geometric relationship between the base of the triangle and the side of the square.

Step 2: Key Formula or Approach:
- Area of a square with side s: $A_{square} = s^2$
- Area of a triangle: $A_{triangle} = \frac{1}{2} \times \text{base} \times \text{height}$

Step 3: Detailed Explanation:
Let the side length of the square ADFC be s.
Therefore, $AD = DF = FC = CA = s$.
The area of the square ADFC is s^2.

We are given the relationship $CB = \frac{CF}{4}$. Since $CF = s$, we have:

$$CB = \frac{s}{4}$$

Now, let's find the area of triangle ABC.
We can consider CB as the base of the triangle. The height of the triangle corresponding to this base is the perpendicular distance from vertex A to the line containing the base CF.
Since ADFC is a square, the side AC is perpendicular to the side CF.
Therefore, the height of $\triangle ABC$ is the length of the side AC, which is s.
Area of $\triangle ABC = \frac{1}{2} \times \text{base} \times \text{height}$

$$\text{Area}(\triangle ABC) = \frac{1}{2} \times CB \times AC = \frac{1}{2} \times \left(\frac{s}{4}\right) \times s = \frac{s^2}{8}$$

The question asks for the ratio of the area of triangle ABC to the area of square ADFC.

$$\text{Ratio} = \frac{\text{Area}(\triangle ABC)}{\text{Area}(ADFC)} = \frac{s^2/8}{s^2} = \frac{1}{8}$$

Step 4: Final Answer:
The ratio of the area of triangle ABC to the area of square ADFC is 1/8.

> **Quick Tip**
>
> In geometry problems, assign a variable (like 's') to a key length. Express all other lengths and areas in terms of this variable. The variable will cancel out when you calculate the ratio.

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3. If the product of two integers x and y is less than 82 with y being a multiple of three. What is the highest value that x may have?
(A) 13
(B) 42
(C) 27
(D) 30
(E) 34

Correct Answer: (C) 27

Solution:

Step 1: Understanding the Concept:
We are given an inequality involving the product of two integers, x and y. We are also given a condition on y. We need to find the maximum possible integer value for x.

Step 2: Key Formula or Approach:
The problem states:
1. x, y are integers.

2. $x \cdot y < 82$.
3. y is a multiple of three.
To maximize the value of x, we should make the other factor, y, as small as possible, while still being positive (to avoid flipping the inequality sign).

Step 3: Detailed Explanation:
The condition is $x \cdot y < 82$. To find the highest possible value for x, we need to analyze the values y can take.
y is an integer and a multiple of three. Possible values for y are $..., -6, -3, 3, 6, 9, ...$
If we choose a negative value for y (e.g., y = -3), the inequality becomes $x \cdot (-3) < 82$, which simplifies to $-3x < 82 \implies x > -82/3 \implies x > -27.33$. This puts a lower bound on x, but not an upper bound, so x could be infinitely large. The phrase "highest value" implies we are looking for a maximum, so we should assume x and y are positive.
Let's assume x and y are positive integers. To maximize x in the inequality $x < \frac{82}{y}$, we must choose the smallest possible positive value for y.
The smallest positive integer that is a multiple of three is $y = 3$.
Substituting $y = 3$ into the inequality:

$$x \cdot 3 < 82$$

Now, solve for x:

$$x < \frac{82}{3}$$
$$x < 27.33...$$

Since x must be an integer, the highest integer value that x can take while being less than 27.33... is 27.

Step 4: Final Answer:
The highest value that x may have is 27.

> **Quick Tip**
>
> When trying to maximize one variable in an inequality like $x \cdot y < K$, if the variables are positive, you should minimize the other variable. Always check the constraints (e.g., integer, multiple of three) to find the appropriate minimum value.

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4. Adam is 2 years older than Mike. The square of Adam's age is 28 greater than the square of Mike's age in years. What is the sum of Adam's age and Mike's age?
(A) 8
(B) 12
(C) 14
(D) 18
(E) 22

Correct Answer: (C) 14

Solution:

Step 1: Understanding the Concept:
This is a word problem that can be translated into a system of algebraic equations. We need to solve for the ages and then find their sum.

Step 2: Key Formula or Approach:
Let A be Adam's age and M be Mike's age.
Translate the given sentences into equations:
1. "Adam is 2 years older than Mike": $A = M + 2$, which can be rewritten as $A - M = 2$.
2. "The square of Adam's age is 28 greater than the square of Mike's age": $A^2 = M^2 + 28$, which can be rewritten as $A^2 - M^2 = 28$.
We can use the difference of squares factorization: $a^2 - b^2 = (a - b)(a + b)$.

Step 3: Detailed Explanation:
We have the two equations:
1) $A - M = 2$
2) $A^2 - M^2 = 28$
Apply the difference of squares formula to the second equation:

$$(A - M)(A + M) = 28$$

We know from the first equation that $A - M = 2$. Substitute this into the factored second equation:

$$(2)(A + M) = 28$$

Now, we can solve for the sum of their ages, $A + M$:

$$A + M = \frac{28}{2}$$
$$A + M = 14$$

The question asks for the sum of their ages, which we have found to be 14.

Step 4: Final Answer:
The sum of Adam's age and Mike's age is 14.

Quick Tip

Recognizing algebraic identities like the difference of squares ($a^2 - b^2 = (a - b)(a + b)$) can significantly shorten your calculation time. Instead of solving for each variable individually, you can often solve directly for the quantity requested.

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5. Adam has bought a certain number of apples. Jen has bought 5 times the fruit that Adam has bought. If Jen has bought two and a half dozen apples how many apples does Adam have?
(A) 6 apples
(B) 8 apples
(C) 12 apples
(D) 24 apples
(E) 30 apples

Correct Answer: (A) 6 apples

Solution:

Step 1: Understanding the Concept:
This is a word problem that can be solved by setting up a simple equation based on the given information.

Step 2: Key Formula or Approach:
First, convert the quantity "two and a half dozen" into a specific number.
- 1 dozen = 12 items.
Then, set up an equation relating the number of apples Adam has to the number of apples Jen has.

Step 3: Detailed Explanation:
Let A be the number of apples Adam has.
Let J be the number of apples Jen has.
From the problem, "Jen has bought 5 times the fruit that Adam has bought":

$$J = 5 \times A$$

We are also told that "Jen has bought two and a half dozen apples". Let's calculate this number:

$$\text{Two and a half dozen} = 2.5 \times 12$$
$$2.5 \times 12 = 30$$

So, Jen has 30 apples ($J = 30$).
Now we can substitute the value of J into our equation:

$$30 = 5 \times A$$

To find the number of apples Adam has, solve for A:

$$A = \frac{30}{5}$$
$$A = 6$$

Step 4: Final Answer:
Adam has 6 apples.

Quick Tip

Break down word problems into smaller pieces of information. First, identify the known quantities (like "a dozen"), then define variables for the unknowns, and finally, translate the relationships into mathematical equations.

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6. What would be the circumference of a circle that has been inscribed in a square of area 5.

(A) 3π
(B) 5π
(C) $\sqrt{5}\pi$
(D) $\pi + 3/2$
(E) $\sqrt{5}/2\pi$

Correct Answer: (C) $\sqrt{5}\pi$

Solution:

Step 1: Understanding the Concept:
The problem involves the relationship between a square and a circle inscribed within it. An inscribed circle is the largest possible circle that can fit inside the square, touching all four sides.

Step 2: Key Formula or Approach:
- Area of a square with side s: $A = s^2$
- For a circle inscribed in a square, the diameter of the circle is equal to the side length of the square: $d = s$.
- Circumference of a circle with diameter d: $C = \pi d$.

Step 3: Detailed Explanation:
We are given that the area of the square is 5.
Let the side length of the square be s.

$$A_{square} = s^2 = 5$$

To find the side length, we take the square root of the area:

$$s = \sqrt{5}$$

A circle is inscribed in this square. This means the diameter of the circle, d, is equal to the side length of the square, s.

$$d = s = \sqrt{5}$$

The question asks for the circumference of this circle. The formula for circumference is $C = \pi d$. Substituting the value of the diameter we found:

$$C = \pi \times \sqrt{5}$$

This is commonly written as $\sqrt{5}\pi$.

Step 4: Final Answer:
The circumference of the circle is $\sqrt{5}\pi$.

> **Quick Tip**
> Always visualize the geometric setup. For an inscribed circle in a square, the key is realizing the diameter equals the side length. For a circumscribed circle, the key is realizing the diagonal of the square equals the diameter.

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7. What could be the possible value of 'y' after the intersection of points y= -x² + 3 and y= x² - 5
(A) $\sqrt{2}$
(B) 3/2
(C) 4
(D) $\sqrt{8}$
(E) -1

Correct Answer: (E) -1

Solution:

Step 1: Understanding the Concept:
The intersection points of two graphs are the points (x, y) that satisfy both equations simultaneously. To find these points, we can set the expressions for y equal to each other.

Step 2: Key Formula or Approach:
Given the two equations:
1) $y = -x^2 + 3$
2) $y = x^2 - 5$
At the point of intersection, the y-values are the same. Therefore, we can equate the right-hand sides of the equations to solve for the x-coordinate of the intersection.

Step 3: Detailed Explanation:
Set the two expressions for y equal to each other:

$$-x^2 + 3 = x^2 - 5$$

Now, solve this equation for x. Rearrange the terms to group the x^2 terms on one side and the constants on the other.

$$3 + 5 = x^2 + x^2$$
$$8 = 2x^2$$

$$x^2 = 4$$

Taking the square root of both sides gives two possible values for x:

$$x = 2 \quad \text{or} \quad x = -2$$

The question asks for the possible value of 'y'. To find the y-value, substitute either of these x-values back into one of the original equations. Let's use the second equation, $y = x^2 - 5$.
For $x = 2$:

$$y = (2)^2 - 5 = 4 - 5 = -1$$

For $x = -2$:

$$y = (-2)^2 - 5 = 4 - 5 = -1$$

In both cases, the y-value at the intersection points is -1. Therefore, the only possible value for 'y' is -1.

Step 4: Final Answer:
The possible value of 'y' at the intersection points is -1.

> Quick Tip
>
> When finding the intersection of two functions, after setting them equal and solving for x, remember to substitute the x-value back into one of the original equations to find the corresponding y-value. It's a good practice to check your answer by substituting into the other equation as well to ensure accuracy.

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8. A house is built by 20 workers in 30 days. How many workers will be needed to complete the work in 15 days?
(A) 20
(B) 34
(C) 40
(D) 45
(E) 52

Correct Answer: (C) 40

Solution:

Step 1: Understanding the Concept:
This is a classic inverse proportion problem. The total amount of work is constant. The number of workers is inversely proportional to the number of days required to complete the work. This means if you decrease the time, you must increase the number of workers.

Step 2: Key Formula or Approach:
The total work done can be measured in "worker-days".
Total Work = (Number of Workers) × (Number of Days)
Let W_1 and D_1 be the initial number of workers and days, and W_2 and D_2 be the new number of workers and days. Since the total work is the same:

$$W_1 \times D_1 = W_2 \times D_2$$

Step 3: Detailed Explanation:
We are given the initial conditions:
$W_1 = 20$ workers
$D_1 = 30$ days
First, calculate the total work required to build the house in worker-days:

$$\text{Total Work} = 20 \text{ workers} \times 30 \text{ days} = 600 \text{ worker-days}$$

Now, we need to complete this same amount of work in a different number of days:
$D_2 = 15$ days
We need to find the number of workers, W_2, required. Using the formula:

$$\text{Total Work} = W_2 \times D_2$$
$$600 = W_2 \times 15$$

Solve for W_2:

$$W_2 = \frac{600}{15}$$

To simplify the division: $600/15 = (60 \times 10)/15 = 4 \times 10 = 40$.

$$W_2 = 40$$

So, 40 workers will be needed to complete the work in 15 days.

Step 4: Final Answer:
40 workers will be needed.

Quick Tip

For inverse proportion problems, you can also use reasoning. The time is halved (from 30 days to 15 days), so the number of workers must be doubled to get the same amount of work done. Double 20 workers is 40 workers.

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9. Master Chef Alan makes a dish every day from one of his recipe books. He has written 3 books and each book contains 15 different recipes. What is the probability that he will cook 4th dish from 3rd book today?
(A) 1/15
(B) 3/45

(C) 3/13
(D) 1/45
(E) 1/3

Correct Answer: (D) 1/45

Solution:

Step 1: Understanding the Concept:
This is a basic probability problem. Probability is calculated as the ratio of the number of favorable outcomes to the total number of possible outcomes. We assume that any recipe is equally likely to be chosen.

Step 2: Key Formula or Approach:

$$\text{Probability} = \frac{\text{Number of Favorable Outcomes}}{\text{Total Number of Possible Outcomes}}$$

First, we need to determine the total number of recipes Alan can choose from. Then, we identify how many of those choices match the specific outcome we are interested in.

Step 3: Detailed Explanation:
Calculate the Total Number of Possible Outcomes:
Alan has 3 books.
Each book has 15 recipes.
Total number of recipes = (Number of books) × (Number of recipes per book)

$$\text{Total Outcomes} = 3 \times 15 = 45$$

So, there are 45 different dishes Alan could potentially cook.

Calculate the Number of Favorable Outcomes:
The specific event we are interested in is ”he will cook 4th dish from 3rd book”.
This refers to one single, specific recipe.
Therefore, the number of favorable outcomes is 1.

Calculate the Probability:

$$P(\text{4th dish from 3rd book}) = \frac{1}{45}$$

Step 4: Final Answer:
The probability that he will cook the 4th dish from the 3rd book is 1/45.

Quick Tip

In probability questions, the first step is always to clearly define the sample space (the set of all possible outcomes). Then, identify the specific event (favorable outcome) you're interested in. Don't be confused by extra details; the ”4th dish from the 3rd book” is just a label for one unique choice out of the total.

10. In a Christmas sale, the prices of Dell Laptops were reduced by 10% for public. However, for Dell employees, the price was further reduced by 5%. If the original price of a laptop was $330 before Christmas sale, approximately how much would it cost in a Christmas sale to a Dell employee?
(A) $271
(B) $277
(C) $282
(D) $287
(E) $295

Correct Answer: (C) $282

Solution:

Step 1: Understanding the Concept:
This problem involves successive percentage discounts. A "further" reduction means the second discount is applied to the already discounted price, not the original price.

Step 2: Key Formula or Approach:
To apply a percentage discount, you can multiply the price by (1 - discount rate).
- Price after 1st discount = Original Price × (1 - 10%)
- Final Price = (Price after 1st discount) × (1 - 5%)

Step 3: Detailed Explanation:
The original price of the laptop is $330.
First Discount (for the public):
The price is reduced by 10%.
Discount amount = 10% of $330 = 0.10 × 330 = $33.
Price after first discount = $330 - $33 = $297.
Alternatively, Price = $330 × (1 - 0.10) = $330 × 0.90 = $297.

Second Discount (for Dell employees):
The price was **further** reduced by 5%. This 5Second discount amount = 5% of $297 = 0.05 × 297.
Calculation: 0.05 × 297 = (5/100) × 297 = 1485/100 = $14.85.
Final price for an employee = $297 - $14.85 = $282.15.
Alternatively, Final Price = $297 × (1 - 0.05) = $297 × 0.95 = $282.15.

The question asks for the approximate cost. $282.15 is approximately $282.

Step 4: Final Answer:
The approximate cost for a Dell employee would be $282.

Quick Tip

For successive discounts of $d_1\%$ and $d_2\%$, the final price is calculated by applying them one after the other. It is not the same as a single discount of $(d_1 + d_2)\%$. A common mistake is to add the percentages (10