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The Learning App

GMAT QUANT
[DATA SUFFICIENCY]
- Solutions

1. Solution:

Topic: Data Analysis

Concept Tested: Probability

Type of Question: Data Sufficiency (DS)

Given: $B + G = 8$.

$$\frac{B}{8} \times \frac{B - 1}{7} > \frac{1}{4}$$

Is $B(B - 1) > 14$?

Is $B \geq 5$?

So if number of boys in students are more than or equal to 5, 6 or 7. Then probability X > ¼.

So, basically the crux of the question boils down to whether the number of boys in 8 students is more than or equal to 5 (5, 6 or 7).

Statement I is insufficient:

Given: More than 45% of the students are boys.

From the statement 1 it's given that; $B > 0.45 \times 8; B > 3.6$

As the statement 1 suggests there may be 4 Boys and in this case the answer to the question will be NO or there may be more than 4 Boys (5,6 ….) and in this case the answer will be YES.

Hence statement 1 is not sufficient to answer. We can eliminate the options A and D.

Statement II is sufficient:

Given: The probability that both the selected students will be girls is more than 20%.

From the statement 2; it's given that $\frac{G}{8} \times \frac{G-1}{7} > \frac{1}{5}$

$G(G - 1) > 11.2$

Is $G \geq 4$.

From statement 2 its clear that there are more than or equal to 4 Girls in 8 people: 4, 5, 6, ... hence there are less than or equal to 4 Boys: 4, 3 .... So the answer whether there are more than or equal to 5 Boys is NO.

Hence statement 2 is sufficient to answer that probability that both the selected students are boys, is CANNOT be greater than 25%. We can eliminate the options C and E.

Hence, the answer is B.

2. Solution:

Topic: Data Analysis

Concept Tested: Sets and Venn Diagram

Type of Question: Data Sufficiency (DS)

Given: Total number of houses = 90

Number of houses with balcony = 55

Total number of houses = (# of houses with balcony) + (# of houses with lawn) – (# of houses **with** lawn & balcony) + (# of houses **without** lawn & balcony)

To find: Number of houses with lawn.

Statement I is insufficient:

Given: 35 of the houses in the village A own a balcony but do not have a lawn.

From the statement 1 we know that the houses with only balcony but do not have a lawn = 55 – 35 = 20.

So this gives information about number of houses with balcony and lawn = 20.

But this does not give information about any other parameters.

Hence statement 1 is insufficient to answer. We can eliminate the options A and D.

Statement II is sufficient:

Given: The number of houses in the village A that have a balcony and a lawn is equal to the number of houses in the village A that have neither a balcony nor a lawn.

From this statement we know that;

(# of houses with a balcony and a lawn) = (# of houses without a balcony and a lawn)

$\therefore Total =$ (# of houses with balcony) $+$ (# of houses with lawn) (as remaining tw will cancel out each other)

$90 = 55 + (\# \ of \ houses \ with \ lawn)$

Therefore, number of houses with lawn = 35.

Hence statement 2 is sufficient to answer.

Hence, the answer is B.

3. **Solution:**

Topic: Number Theory

Concept Tested: Terminating Decimal

Type of Question: Data Sufficiency (DS)

Given:

p, q, r, s and t are integers.

$x = 4^p 9^q \implies 2^{2p} 3^{2q}$

$y = 4^r 9^s 5^t \implies 2^{2p} 3^{2q} 5^t$

Question: Is $\dfrac{x}{y}$ a terminating decimal?

Approach: As it is a Yes/No Data Sufficiency Question, if we get a definite Yes or Definite No for the questions using the statements, then it is sufficient. Otherwise, it is insufficient.

Note: If $\dfrac{x}{y}$ is a terminating decimal, then y should be of the form $2^m 5^n$, where m and n are non-negative integers.

Statement I is insufficient:

Given that $p > r$

$\implies 2p > 2r$

$\implies$ Denominator (i.e., y) can still have 3s. So, it depends on the relation between q and s.

If $q > s$, then denominator will have only 5s, which will lead to a terminating decimal.

But, if $q < s,$ then denominator will have 3s, which will lead to a non-terminating decimal.

Contradiction.

Therefore, Statement I by itself is insufficient to answer the question asked.

So, eliminate A and D.

$\implies$ The answer is either B, C or E.

Statement II is sufficient:

Given that $q < s$

$\implies$ For sure denominator will have 3s.

So, $\dfrac{x}{y}$ is a non-terminating decimal.

Since, you are getting a definite No to the main question, it is sufficient to answer the question.

Therefore, Statement II by itself is sufficient to answer the question asked.

Hence, the answer is B.

4. Solution:

Topic: Algebra

Concept Tested: Inequalities and Modulus

Type of Question: Data Sufficiency (DS)

Given: k is a variable.

Question: Is $k > 0$?

Approach: As it is a Yes/No Data Sufficiency Question, if we get a definite Yes or Definite No for the questions using the statements, then it is sufficient. Otherwise, it is insufficient. Use plugging in according to statements then plug the same number in the question.

Statement I is insufficient:

Given that $|k + 4| < 5$

If we plug in $k = -1, \implies k < 0$

If we plug in $k = \frac{1}{2} \implies k > 0$

Contradiction.

Therefore, Statement I by itself is insufficient to answer the question asked.

So, eliminate A and D.

The answer is either B, C or E.

Statement II is insufficient:

Given that $|k - 4| < 5$

If we plug in $k = -\frac{1}{2} \implies k < 0$

If we plug in $k = 1, \implies k > 0$

Contradiction.

Therefore, Statement II by itself is insufficient to answer the question asked.

So, eliminate B.

Combine both statements:

Plug in such that both statement satisfy.

If we plug in $k = -\frac{1}{2} \implies k < 0$

If we plug in $k = \frac{1}{2} \implies k > 0$

Again contradiction.

Therefore, even after combining the two statements, it is insufficient to answer the question asked.

Hence, the answer is E.

5. **Solution:**

Topic: Arithmetic

Concept Tested: Work, Rate and Time

Type of Question: Data Sufficiency (DS)

Approach: Rate is inversely proportional to time. And when two machines/bodies are working together, add the rate.

Given:

Norman and Andrew can design a room in 9 hours working together continuously.

$\Rightarrow$Combined Rate $= \frac{1}{9}$ =Rate of Andrew + Rate of Norman

Question: What is the time taken by Andrew to design the room alone?

Means, if you get rate of Andrew from the statements, it becomes sufficient to find the time.

Statement I is sufficient:

Given, working continuously, Norman takes 12 hours to design the room alone.

$\Rightarrow$Rate of Norman $\Rightarrow \frac{1}{12}$

That Means, Rate of Andrew $\frac{1}{9} - \frac{1}{12} = \frac{1}{36}$

Since, we got the rate of Andrew, we can also find the time$= 36 hours$.

Therefore, Statement I by itself is sufficient to answer the question asked.

So, eliminate B, C and E.

$\Rightarrow$ The answer is either A or D.

Statement II is sufficient:

Given, working continuously, Andrew takes 12 hours to design one third of the room.

$\Rightarrow$To do design full room, Andrew takes $12 \times 3 = 36 hours$.

Therefore, Statement II by itself is sufficient to answer the question asked.

Hence, the answer is D.

6. <u>Solution:</u>

Topic: Data Analysis

Concept Tested: Mean, Median and Mode

Type of Question: Data Sufficiency (DS)

Given: Five people in a company, they have integer salaries in million.

Question: difference between the highest and the lowest salary among those five people in a company.

Statement I is insufficient:

Given that mean and median of those five salaries are 5.

From that, we can find the total of those five salaries, which is 25.

We can find the third highest salary which is 5, and the remaining salary should added up to 20.

But we could not find the lowest and highest value.

Therefore, Statement I by itself is insufficient to answer the question.

So, eliminate A and D.

$\Rightarrow$ The answer is either B, C or E.

Statement II is insufficient:

Given that mode and the highest salary is 8.

We can find the last salary which is 8 and since mode is 8, it could be all the five salaries as 8 , giving us the difference as 0 or we can even get a different value.

Therefore, Statement II by itself is insufficient to answer the question.

So, eliminate B.

$\Rightarrow$ The answer is either C or E

Now let us combine the statements,

According to the information, there are 5 people, since the median is 5 and the mode is 8 it has to be as follows:

1st-x

2nd-y

3rd -5

4th-8

5th -8

x + y = 25-(5+8+8) = 4

The two set of integer values which are possible are 1,3 and 2,2.

2,2 is not possible since the mode has to be only 8.

Hence the values which are possible are as follows:

1st-1

2nd-3

3rd -5

4th-8

5th -8

The difference between highest and lowest is 8-1 = 7. Hence sufficient.

Therefore, combining the statements I and II is sufficient to answer the question asked.
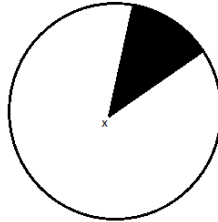
Hence, the answer is C.

7. **Solution:**

Topic: Triangles and Circles

Concept Tested: Circles

Type of Question: Data Sufficiency (DS)

As it is a Yes/No Data Sufficiency Question, if we get a definite Yes or Definite No for the questions using the statements, then it is sufficient. Otherwise, it is insufficient.

We need to check whether the shaded part represent more than 10 minutes. i.e. > 10/60 which is >1/6

Statement I is insufficient:

Given that the length of the clock hand is 20, we can calculate the area of the circle which is 400π.

But we cannot calculate the area of the sector.

We need to know whether it greater than $\frac{1}{6} * 400\pi = 66.66\pi$.

Therefore, Statement I by itself is insufficient to answer the question asked.

So, eliminate A and D.

$\implies$ The answer is either B, C or E.

Statement II is insufficient:

This statement tells us that the area of the sector is more than 66π, but we don't know about the area of the circle.

Therefore, Statement II by itself is insufficient to answer the question asked.

So, eliminate B.

Combine both statements:

From the 1st statement, area of the circle is 400π, we need to check whether it is greater than 66.66π, and from the 2nd statement, area of the sector is more than 66π.

Here again, the area of the sector can be 66.1π, this says NO to the question or

The area of the sector can be even 67π. This says YES to the question.

Therefore, even after combining the two statements, it is insufficient to answer the question asked.

Hence, the answer is E.

8. **Solution:**

Topic: Data Analysis
Concept Tested: Properties of Standard Deviation
Type of Question: Data Sufficiency (DS)

Given:

Set S = {1, a, b}

a, b ≥ 1 and a ≤ b

Question: Value of "b"?

Approach: Using the properties of Standard deviation.

Statement I is sufficient:

The standard deviation of Set S is 0.

Standard deviation of a Set or list is 0 if all the elements are equal.

So here, a = b = 1.

Sufficient.

Statement II is sufficient:

The range of Set S is 0.

Range = Maximum Value – Minimum Value.

Here,

0 = Maximum Value – Minimum Value.

Maximum value = minimum value

So, all the elements have to be same.

i.e.,

a = b = 1

So sufficient.

Hence, the answer is D.

9. **Solution:**

Topic: Algebra

Concept Tested: Patterns and Sequences
Type of Question: Data Sufficiency (DS)

Given:

"S" is a sequence whose terms were a_1, a_2, a_3, …a_n

Question: a_{11}-a_{10}?

Approach: Definition of arithmetic progression.

Statement I is insufficient:

Difference of the first two terms of the sequence S, a_1 and a_2 is 12.

It is insufficient.

We don't know type of the sequence "S".

It could be an Arithmetic sequence or a geometric sequence.

So insufficient.

Statement II is insufficient:

In the above sequence S, each term after the first is equal to the average of the preceding term and the following term.

The above statement says the sequence is an arithmetic sequence.

Say if first three terms are,

a, a+d, a+2d, …

Then according to the statement

(a + a+2d)/2 = a + d.

So,

Nth term = a + (n-1)*d

a_{11} = a+(10)d

a_{10} = a+(9)d

a_{11} - a_{10} = d

We can see that it's an arithmetic progression but we still don't know the value of "common difference(d)".

So (2) alone insufficient

Together it is sufficient.

We know the common difference from statement (1)
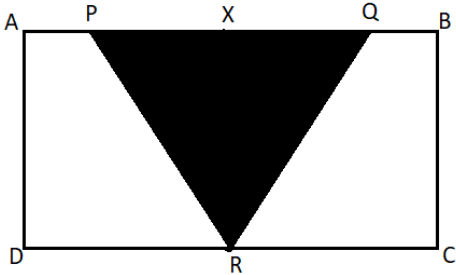
Hence, the answer is C.

10. Solution:

Topic: Geometry
Concept Tested: Shaded Region
Type of Question: Problem Solving (PS)

Given:

ABCD is rectangle and Points X and R are the midpoints of sides AB and CD respectively.

Question:

$$\frac{area\ of\ traingle\ PQR}{area\ of\ rectanlge\ ABCD}\ ?$$

Approach:

Cut and count method.

Statement I is insufficient:

Length and breadth of the rectangle ABCD is 12 and 10 respectively.

We can find the area of the rectangle ABCD.

We also know the height of the triangle (height = breadth).

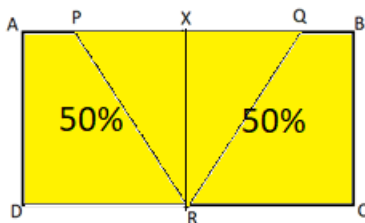But still we don't know the base(PQ) of the triangle.

So insufficient.

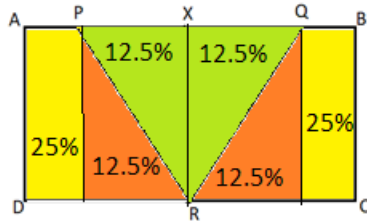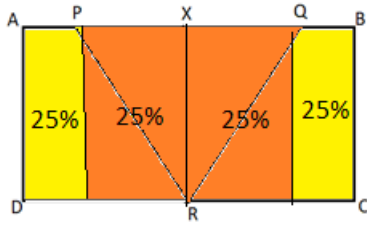**Statement II is sufficient:**

In the above figure above point P is the midpoint of line segment AX and point Q is the midpoint of line segment XB.

This information is more than enough to solve this question. We can cut and count it.

Lets first divide the entire figure into two halves as shown below.

Now, lets further divide each equal half into two more halves as shown below.

We can see that, triangle PQR is 12.5% + 12.5% = 25%.

The ratio of area of triangle PQR/ area of rectangle ABCD = ¼.

So it is sufficient.

Hence, the answer is B.

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