GMAT Quant Section

Geometry – Solutions

Question No.1:

Topic: Geometry

Concept Tested: Circles – Shaded or Unshaded regions

Question Type: Problem Solving

Correct Answer: E

Explanation:

Given: Given,

Diameter of the circular garden = 12, So radius = 6 units.

Since AB = 12 units and P, X, R and Q lies in a straight line.

Question: Area of Shaded region? Area outside the smaller circles but inside the larger circle

Rule: Area of Shaded region = Total area – Area of Unshaded region

Given,

Diameter of the circular garden = 12, So radius = 6 units.

Area of the circular garden = $\pi * r^2 = 36\pi$

Circular bed Q has radius = 2 units

So, Area of the circular bed Q = $\pi * 2^2 = 4\pi$

Since AB = 12 units and P, X, R and Q lies in a straight line.

AB = AR + RB

12 = AR + 4

AR = 8

AR is the diameter of the circular bed P.

So, Area of the circular bed P = $\pi * 4^2 = 16\pi$

Area of the shaded region = Area of the Circular Garden – Area of the two circular flower beds

Area of the shaded region = $36\pi - (4\pi + 16\pi)$

So, area of the shaded region = 16π.

So, the answer is E

Question No.2:

Topic: Geometry

Concept Tested: Quadrilaterals - Rectangles

Question Type: Data sufficiency

Correct Answer: D

Explanation:

Given: "a" = Longest side and "b" = shorter side. So, a > b.

Perimeter = $2 * (Length + Breadth) = 2(a + b) = 96$

$a + b = 48$

Question: Value of "a"

Rule: Area of rectangle = Length * Breadth

Perimeter = $2 * (Length + Breadth)$

Statement I is sufficient:

The area of rectangle is 572 square inches.

$a * b = 576$

Already is given that, $a + b = 48$. If we have two equations with the two variables, we can solve. Substituting b = 48 – a

$a * (48 - a) = 576$

$a^2 - 48a + 576 = 0$

$a = 22 \; or \; 26$

But $a + b = 48$, with $a > b$

So, a = 26 and b = 22

Therefore, Statement I by itself is sufficient to answer the question asked. So, eliminate B, C and E. The answer will be either A or D.

Statement II is sufficient:

The length of the shorter side is 4 inches less than the length of longer side.

$a = b + 4$

If we have two equations with the two variables, we can solve.

$b + 4 + b = 48$

$b = 22$. So, a = 26

Therefore, Statement II by itself is Sufficient to answer the question asked. So, eliminate A.

Hence, the answer is D.

Question No.3:

Topic: Geometry

Concept Tested: Rectangular solids – Volume and Area

Question Type: Data sufficiency

Correct Answer: E

Explanation:

Given: Rectangular solid "P"

Question: Volume of "P"?

Rule: Volume of P = $length * breadth * height$

Statement I is insufficient:

Surface area of one of the faces is 48.

Let's say, Surface area of one face = length * breadth = 48

Then we can have the following combination of l*b.

1*48 OR 2*24 OR 3*16 OR 4*12 OR 6*8...

We can have different values of volume depending on the value of third side.

Therefore, Statement I by itself is insufficient to answer the question asked. So, eliminate A and D. The answer will be either B, C or E.

Statement II is insufficient:

Length of one of the edges is 3.

The second statement says that the length of one of the edges is 3. This could be the value of width(w), height(h) or length(l). But to find out the value of the volume, we need all the 3 values.

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

Both the statements taken together (Combining I and II).

Now, combining both the statements together, we see that though we know the surface area of one of the faces and one of the lengths, we still don't know whether the value is width, height or length.

With the help of the given information, we can find the length of one more length as

48 =3 * width OR 3 * height OR 3 * length.

OR it could $length * width = 48 \, and \, height = 3$

We still won't get the value of all the dimensions and hence won't be able to find out the volume. Therefore, even after combining two statements, it is insufficient to answer the question asked. Eliminate C.

Hence, the answer is E.

Question No.4:

Topic: Geometry

Concept Tested: Triangles

Question Type: Problem Solving

Correct Answer: A

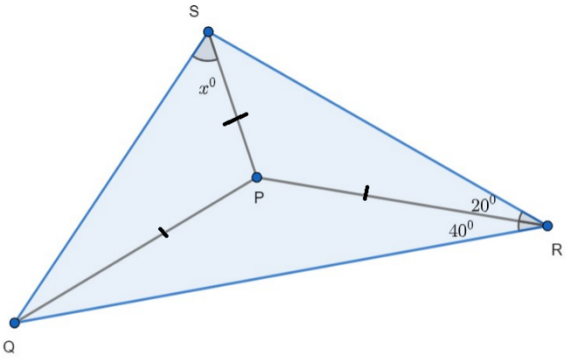
Explanation:

Given: QRS is a triangle.

Question: Volume of "x", that is, angle QSP?

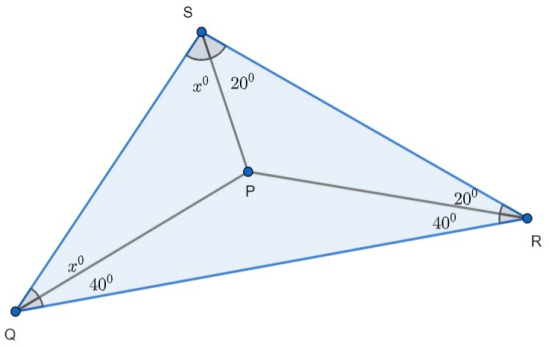
Rule: Isosceles triangle – 2 sides are equal and 2 angles are equal.

Given, PQ = PS = PR



All three triangles PQR, PRS and PQS are isosceles triangles.

In an Isosceles triangle – 2 sides are equal and 2 angles are equal.



And from the above diagram, we can say that angle SPR = 140^0, angle QPR = 100^0. Because of interior angles of a triangle is 180^0.

Angle QPS =120, because sum of the complete angle is 360^0 at point P(complete rotation).

From triangle SQP,

$x^0 + x^0 + 120^0 = 180^0$

x = 30.

Hence, the answer is A.

Question No.5:

Topic: Geometry

Concept Tested: Rectangular solids – Volume and Area

Question Type: Problem Solving

Correct Answer: C

Explanation:

Given: Rectangular box, whose dimensions are 8 inches, 7inches, and 6 inches

Question: How many cubes inside the rectangular box.

Rule: Volume of Cuboid = $length * breadth * height$

Volume of Cube = $side * side * side$

Mistake students do here is, $\frac{volume\ of\ rectangular\ box}{Volume\ of\ 2-inch\ cube} = \frac{8*7*6}{2*2*2} = 42$

Definitely this is wrong, as the width is only 7 units.

Along the length of the rectangular box, we can keep four 2-inch cubes

Similarly, along the width of the rectangular box we can keep three 2-inch cubes

And, along the height of the rectangular box we can keep three 2-inch cubes

So, number of cubical boxes can be kept maximum inside is 4 * 3 * 3 = 36 cubes.

Hence the answer is C.