Mensuration Questions for SSC CGL Tier 2 PDF

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Instructions

For the following questions answer them individually

Question 1

Length and breadth of a rectangle are increased by 40% and 70% respectively. What will be the percentage increase in the area of rectangle?

A 118

B 110

C 138

D 128

Answer: C

Explanation:

Let length and breadth of rectangle initially be 10 units

=> Area, $A = 10 \times 10 = 100$ sq.units

Length is increased by 40%, => New length = $10 + (\frac{40}{100} \times 10) = 14$ units

Similarly, new breadth = $10 + (\frac{70}{100} \times 10) = 17$ units

=> New area, $A' = 14 \times 17 = 238$ sq.units

$\therefore$ % increase in area = $\frac{(238-100)}{100} \times 100 = 138\%$

=> Ans - (C)

Question 2

The perimeter of a square is 40 cm, find its area?

A 100 sq cm

B 25 sq cm

C 50 sq cm

D 160 sq cm

Answer: A

Explanation:

Let side of square = s cm

Perimeter of square = $4 \times s = 40$

=> $s = \frac{40}{4} = 10$ cm

$\therefore$ Area of square = $(s)^2$

= $(10)^2 = 100cm^2$

=> Ans - (A)

Question 3

The circumference of a circle is 88 cm, find its area?

A 616 sq cm

B 308 sq cm

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C 154 sq cm

D 77 sq cm

Answer: A

Explanation:

Let the radius of circle = r cm

Circumference of circle = $2\pi r = 88$

=> $2 \times \frac{22}{7} \times r = 88$

=> $r = \frac{88 \times 7}{44} = 14$ cm

$\therefore$ Area of circle = πr^2

= $\frac{22}{7} \times (14)^2$

= $22 \times 2 \times 14 = 616 cm^2$

=> Ans - (A)

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Question 4

The total surface area of a hemisphere is 166.32 sq cm, find its curved surface area?

A 221.76 sq cm

B 36.96 sq cm

C 110.88 sq cm

D 55.44 sq cm

Answer: C

Explanation:

Let radius of hemisphere = r cm

Total surface area of hemisphere = $3\pi r^2 = 166.32$ ----------(i)

Multiplying equation (i) by $\frac{2}{3}$

=> $\frac{2}{3} \times 3\pi r^2 = \frac{2}{3} \times 166.32$

=> Curved Surface area of hemisphere = $2\pi r^2 = 2 \times 55.44 = 110.88 cm^2$

=> Ans - (C)

Question 5

If G is the centroid of triangle ABC and area of triangle ABC = 48cm ^{2}, then the area of triangle BGC is

A 8 cm^2

B 16 cm^2

C 24 cm^2

D 32 cm^2

Answer: B

Explanation:

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As we know area of triangle, with centroid as one of the vertices and remaining 2 triangle vertices, is $\frac{1}{3}$rd of the area of whole triangle.
Hence area will be $\frac{48}{3}$ = 16

Question 6

In △ PQR, the line drawn from the vertex P intersects QR at a point S. If QR = 4.5 cm and SR = 1.5 cm then the ratios of the area of triangle PQS and triangle PSR is

A 4 : 1

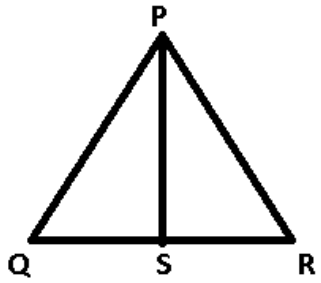
B 3 : 1

C 3 : 2

D 2 : 1

Answer: D

Explanation:
NOTE :- The ratio of area of two triangles on same base is equal to the ratio of two corresponding sides of the two triangles.



Given : QR = 4.5 cm and SR = 1.5 cm

=> QS = QR - SR = 4.5-1.5 = 3 cm

Since, the two triangles PQS and PSR have same base PS

$\Rightarrow \frac{area(\triangle PQS)}{area(\triangle PSR)} = \frac{QS}{SR}$

$= \frac{3}{1.5}$ = 2 : 1

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Question 7

If G is the centroid and AD, BE, CF are three medians of triangle ABC with area 72 sq cm , then the area of triangle BDG is :

A 12 sq cm

B 16 sq cm

C 24 sq cm

D 8 sq cm

Answer: A

Explanation:
The area of triangle formed by any two vertices and centroid is (1/3) times the area of ABC.
Also the median divides the triangle into two equal areas.
So, area of BDG = (1/6) times of ABC
= (1/6)*72
=12

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Question 8

The three medians AD, BE and CF of triangle ABC intersect at point G. If the area of triangle ABC is 60 sq.cm. then the area of the quadrilateral BDGF is :

A 10 sq.cm

B 15 sq.cm

C 20 sq.cm

D 30 sq.cm

Answer: C

Explanation:
Given ΔABC, G is the centroid and AD,BE, CF are three medians and the area of ΔAGE = 10
As we know the median divides the triangle into 6 triangles of equal area
Hence area of the quadrilateral BDGF = 2*ΔAGE = 2*10
area of the quadrilateral BDGF = 20

Question 9

In triangle ABC, AD, BE and CF are the medians intersecting at point G and area of triangle ABC is 156 cm2. What is the area $(in cm^2)$ of triangle FGE?

A 13

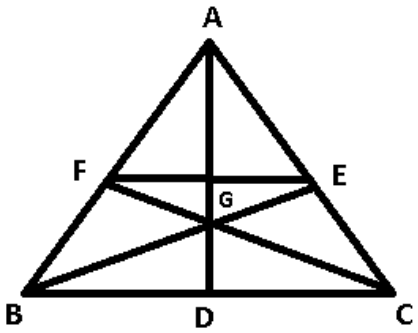
B 26

C 39

D 52

Answer: A

Explanation:



Medians of a triangle divides the triangle into 6 parts of equal areas.

Also, ar(△ ABC) = 156

=> ar(△ AFG) = ar(△ FBG) = ar(△ BGD) = ar(△ DGC) = ar(△ CGE) = ar(△ EGA) = $\frac{156}{6} = 26\ cm^2$

=> ar(AFGE) = ar(△ AFG) + ar(△ EAG)

= $26 + 26 = 52\ cm^2$

∴ ar(△ FGE) = $\frac{1}{4} \times$ ar(AFGE)

= $\frac{52}{4} = 13\ cm^2$

=> Ans - (A)

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Question 10

The tangents drawn at points A and B of a circle with centre O, meet at P. If ∠AOB = 120° and AP = 6 cm, then what is the area of triangle (in cm^2) APB?

A $6\sqrt{3}$

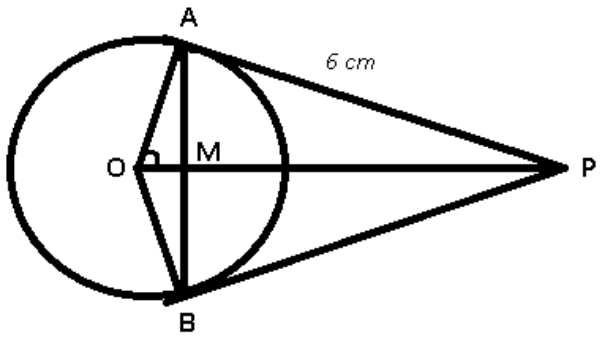
B $8\sqrt{3}$

C 9

D $9\sqrt{3}$

Answer: D

Explanation:



Given : ∠AOB = 120° and AP = 6 cm and $\angle$ OAP = 90°

To find : ar($\triangle$ APB) = ?

Solution : $\angle$ AOP = $\frac{1}{2}\angle$ AOB = $\frac{120}{2} = 60°$

In $\triangle$ AOP,

=> $tan(\angle AOP) = \frac{AP}{OA}$

=> $tan(60°) = \frac{6}{OA}$

=> $\sqrt{3} = \frac{6}{OA}$

=> $OA = \frac{6}{\sqrt{3}} = 2\sqrt{3}$ cm

Thus, area of $\triangle$ AOP = $\frac{1}{2} \times (OA) \times (AP)$

$\frac{1}{2} \times (2\sqrt{3}) \times (6) = 6\sqrt{3}\ cm^2$ ----------(i)

Now, in $\triangle$ AOM

=> $sin(\angle AOM) = \frac{AM}{OA}$

=> $sin(60°) = \frac{AM}{2\sqrt{3}}$

=> $\frac{\sqrt{3}}{2} = \frac{AM}{2\sqrt{3}}$

=> $AM = 3$ cm

Similarly, $OM = \sqrt{3}$ cm

Thus, area of $\triangle$ AOM = $\frac{1}{2} \times (OM) \times (AM)$

$\frac{1}{2} \times (\sqrt{3}) \times (3) = 1.5\sqrt{3}\ cm^2$ ----------(ii)

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=> $ar(\triangle AMP) = ar(\triangle AOP) - ar(\triangle AOM)$

= $6\sqrt{3} - 1.5\sqrt{3} = 4.5\sqrt{3}\ cm^2$

$\therefore ar(\triangle APB) = 2ar(\triangle AMP)$

= $2 \times 4.5\sqrt{3} = 9\sqrt{3}\ cm^2$

=> Ans - (D)

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