



SSC CGL Geometry Previous Year Questions PDF

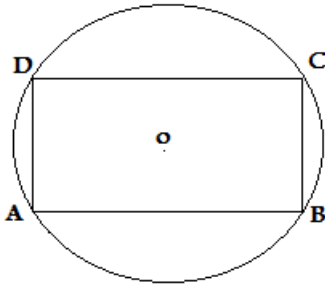
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Instructions

For the following questions answer them individually

Question 1

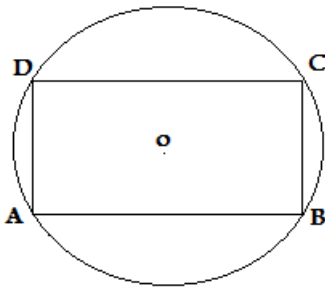
In a cyclic quadrilateral $\angle A + \angle C = \angle B + \angle D = ?$



- A 270°
- B 360°
- C 90°
- D 180°

Answer: D

Explanation:



Sum of opposite angle of cyclic quadrilateral is 180° (D)

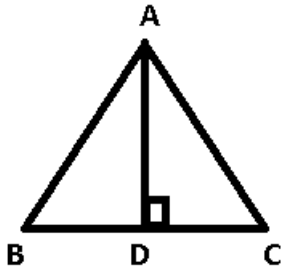
Question 2

The height of an equilateral triangle is 15 cm. The area of the triangle is

- A $50\sqrt{3}$ sq. cm.
- B $70\sqrt{3}$ sq. cm.
- C $75\sqrt{3}$ sq. cm.
- D $150\sqrt{3}$ sq. cm.

Answer: C

Explanation:



AD = 15 cm and ABC is equilateral triangle

In $\triangle ADC$

$$\Rightarrow \tan \angle ACD = \frac{AD}{DC}$$

$$\Rightarrow \tan 60 = \frac{15}{DC}$$

$$\Rightarrow DC = \frac{15}{\sqrt{3}} = 5\sqrt{3}$$

$$\Rightarrow BC = 2 * DC = 10\sqrt{3}$$

$$\text{Area of } \triangle ABC = \frac{\sqrt{3}}{4} * \text{side}^2$$

$$= \frac{\sqrt{3}}{4} * (10\sqrt{3})^2$$

$$= 75\sqrt{3} \text{ cm}^2$$

Question 3

If the interior angles of a five-sided polygon are in the ratio of 2 : 3 : 3 : 5 : 5, then the measure of the smallest angle is

- A 20°
- B 30°
- C 60°
- D 90°

Answer: C

Explanation:

Let the angles of the pentagon be $2x, 3x, 3x, 5x$ and $5x$

$$\text{Sum of angles of a pentagon} = (n - 2) * 180^\circ$$

$$\Rightarrow 2x + 3x + 3x + 5x + 5x = 540^\circ$$

$$\Rightarrow x = 30^\circ$$

$$\Rightarrow \text{Smallest angle} = 2 * 30 = 60^\circ$$

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Question 4

If the lengths of the sides of a triangle are in the ratio 4 : 5 : 6 and the inradius of the triangle is 3 cm, then the altitude of the triangle corresponding to the largest side as base is :

- A 7.5 cm
- B 6 cm

C 10cm

D 8 cm

Answer: A

Explanation:

Let the sides of triangle be $4x$, $5x$ and $6x$

$$\text{Inradius}(r) = 3 \text{ cm and semi perimeter}(s) = \frac{4x+5x+6x}{2} = 7.5x$$

$$\Rightarrow \text{Area of triangle} = r * s = 22.5x$$

Let altitude be h

$$\text{Also area} = \frac{1}{2} * 6x * h = 22.5x$$

$$\Rightarrow h = \frac{22.5}{3} = 7.5 \text{ cm}$$

Question 5

The ratio of inradius and circumradius of a square is :

A $1 : \sqrt{2}$

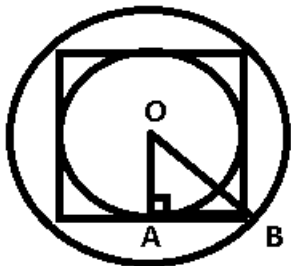
B $\sqrt{2} : \sqrt{3}$

C $1 : 3$

D $1 : 2$

Answer: A

Explanation:



Let the side of square be a

$$\Rightarrow \text{Inradius}(OA) = \frac{a}{2} = AB$$

In $\triangle OAB$

$$\Rightarrow OB = \sqrt{(OA)^2 + (AB)^2}$$

$$\Rightarrow OB = \sqrt{\left(\frac{a}{2}\right)^2 + \left(\frac{a}{2}\right)^2}$$

$$\Rightarrow OB = \sqrt{\frac{a^2}{4} + \frac{a^2}{4}} = \sqrt{\frac{a^2}{2}}$$

$$\Rightarrow OB = \frac{a}{\sqrt{2}}$$

To find : $\frac{OA}{OB}$

$$= \frac{\frac{a}{2}}{\frac{a}{\sqrt{2}}}$$

$$= \frac{1}{\sqrt{2}}$$

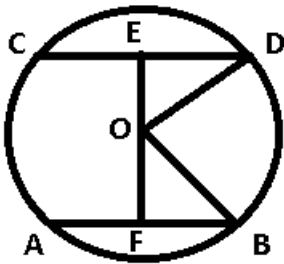
Question 6

AB and CD are two parallel chords of a circle such that $AB = 10$ cm and $CD = 24$ cm. If the chords are on the opposite sides of the centre and distance between them is 17 cm, then the radius of the circle is :

- A 11 cm
- B 12 cm
- C 13 cm
- D 10 cm

Answer: C

Explanation:



Given : $AB = 10$, $CD = 24$ and $EF = 17$ cm

To find : $OB = OD = r = ?$

Solution : A line perpendicular to the chord from the centre of the circle bisects the chord.

$$\Rightarrow AF = FB = \frac{AB}{2} = \frac{10}{2} = 5$$

Similarly, $CE = ED = 12$

Let $OF = x \Rightarrow OE = (17 - x)$

In right $\triangle OFB$

$$\Rightarrow (OB)^2 = (OF)^2 + (FB)^2$$

$$\Rightarrow r^2 = x^2 + 25$$

Now, in right $\triangle OED$

$$\Rightarrow (OD)^2 = (OE)^2 + (ED)^2$$

$$\Rightarrow r^2 = (17 - x)^2 + 144$$

$$\Rightarrow x^2 + 25 = x^2 - 34x + 289 + 144$$

$$\Rightarrow 34x = 408$$

$$\Rightarrow x = \frac{408}{34} = 12$$

$$\Rightarrow r^2 = 12^2 + 25$$

$$\Rightarrow r = \sqrt{169} = 13 \text{ cm}$$

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Question 7

A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator and the denominator. If 3 is added to both the numerator and the denominator it becomes $\frac{5}{6}$. What is the fraction ?

- A $\frac{7}{9}$

- B $\frac{3}{7}$
- C $\frac{5}{9}$
- D $\frac{7}{10}$

Answer: A

Explanation:

Let the fraction be $\frac{x}{y}$

$$\Rightarrow \frac{x+2}{y+2} = \frac{9}{11}$$

$$\Rightarrow 11x + 22 = 9y + 18$$

$$\Rightarrow 11x - 9y + 4 = 0$$

Also, $\frac{x+3}{y+3} = \frac{5}{6}$

$$\Rightarrow 6x + 18 = 5y + 15$$

$$\Rightarrow 6x - 5y + 3 = 0$$

Solving above equations, we get $x = 7$ and $y = 9$

$$\Rightarrow \text{Required fraction} = \frac{7}{9}$$

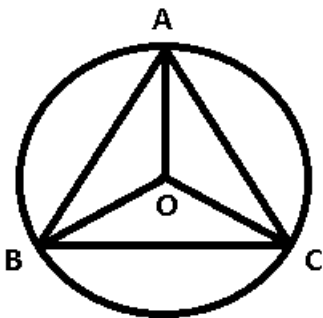
Question 8

If the circumradius of an equilateral triangle ABC be 8 cm, then the height of the triangle is

- A 16 cm
- B 6 cm
- C 8 cm
- D 12 cm

Answer: D

Explanation:



Let ABC be the equilateral triangle and O be the circumcentre. AO extended meet BC at D.

In an equilateral triangle, the centroid, orthocentre, incentre and circumcentre, all lie on the same point, \Rightarrow the median and height are the same lines.

\Rightarrow O is also the centroid of the triangle.

Since, the centroid divides the median in the ratio 2 : 1

It is given that $OA = 8$ cm

$$\Rightarrow \text{Height AD} = 8 * \frac{3}{2} = 12 \text{ cm}$$

Question 9

Let ABC be an equilateral triangle and AX, BY, CZ be the altitudes. Then the right statement out of the four given responses is

- A $AX = BY = CZ$
- B $AX \neq BY = CZ$
- C $AX = BY \neq CZ$
- D $AX \neq BY \neq CZ$

Answer: A

Explanation:

In an equilateral $\triangle ABC$

$$\angle A = \angle B = \angle C = 60^\circ$$

$\Rightarrow AB = BC = CA$ and hence $AX = BY = CZ$

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Question 10

Two supplementary angles are in the ratio 2 : 3. The angles are

- A $33^\circ, 57^\circ$
- B $66^\circ, 114^\circ$
- C $72^\circ, 108^\circ$
- D $36^\circ, 54^\circ$

Answer: C

Explanation:

Let the angles be $2x$ and $3x$

Since, the angles are supplementary

$$\Rightarrow 2x + 3x = 180^\circ$$

$$\Rightarrow x = \frac{180^\circ}{5}$$

$$\Rightarrow x = 36^\circ$$

\Rightarrow Angles are 72° and 108°

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