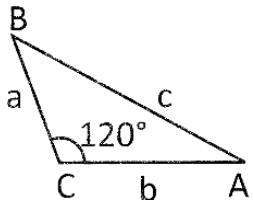
GEOMETRY

Self – Evolution Test

1. In the adjoining figure of $\angle ABC$, $\angle BCA = 120°$ and $AB = c$, $BC = a$, $AC = b$ then:

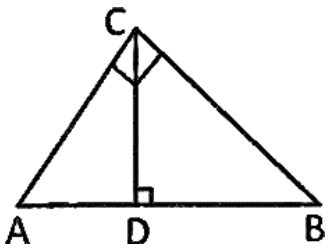


(a) $c^2 = a^2 + b^2 + ba$ (b) $c^2 = a^2 + b^2 - ba$

(c) $c^2 = a^2 + b^2 - 2ba$ (d) $c^2 = a^2 + b^2 + 2ba$

(e) None of these

2. What is the ratio of side and height of and equilateral triangle?

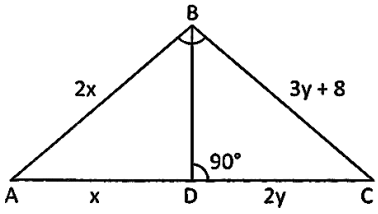


(a) $2:1$ (b) $1:1$

(c) $2:\sqrt{3}$ (d) $\sqrt{3}:2$

(e) None of these

3. In the $\angle ABC$, BD bisects $\angle B$, and is perpendicular to AC. If the lengths of the sides of the triangle are expressed in terms of x and y as shown, then find the value of x and y:

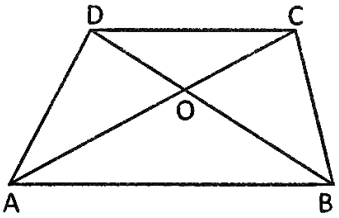


(a) 6, 12 (b) 10, 12

(c) 16, 8 (d) 8, 15

(e) None of these

4. In the given diagram $AB \| AD$. Then which one of the following is true?

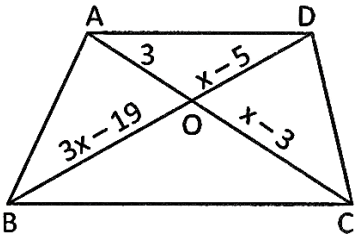


(a) $\frac{AB}{AC} = \frac{AO}{OC}$ (b) $\frac{AB}{CD} = \frac{BO}{OD}$

(c) $\Delta AOB \sim \Delta COD$ (d) All of these

(e) None of these

5. In the figure $BC \| AD$. Find the value of x :



(a) 9, 10 (b) 7, 8

(c) 10, 12 (d) 8, 9

(e) None of these

6. Find the maximum area that can be enclosed in a triangle of perimetre 24 cm :

(a) $32 cm^2$ (b) $16\sqrt{3} cm^2$

(c) $16\sqrt{2} cm^2$ (d) $27 cm^2$

(e) None of these

7. If one of the interior angles of a regular polygon is equal to 5/6 times of one of the interior angles of a regular pentagon, then the number of sides of the polygon is :

(a) 3 (b) 4

(c) 6 (d) 8

(e) None of these

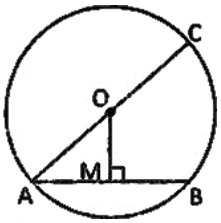
8. If each interior angle of a regular polygon is 3 times its exterior angle, the number of sides of the polygon is :

(a) 4 (b) 5

(c) 6 (d) 8

(e) None of these

9. In the adjoining figure, 0 is the centre of circle and diametre AC = 26 cm. If chord AB = 10 cm, then the distance between chord AB and centre 0 of the circle is:



(a) 24 cm (b) 16cm

(c) 12 cm (d) 11 cm

(e) None of these

10. A polygon has 54 diagonals. The number of sides in the polygon is :

(a) 7 (b) 9

(c) 12 (d) 11

(e) None of these

Answer – Key

1. A	**2.** C	**3.** C	**4.** D	**5.** D
6. B	**7.** B	**8.** D	**9.** C	**10.** C

Explanation

1. **Explanation**

Option (A) is correct.

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$-\frac{1}{2} = \frac{a^2 + b^2 - c^2}{2ab}$$

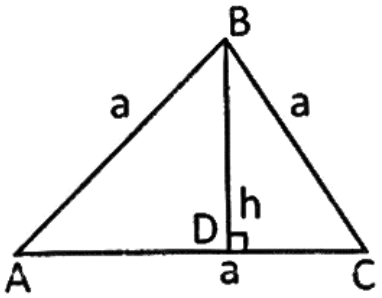
$$\Rightarrow \quad c^2 = a^2 + b^2 + ab$$

2. **Explanation**

Option (C) is correct.

$AB^2 = BD^2 + AD^2$ (Pythagoras theorem)

$$a^2 = h^2 + \left(\frac{9}{2}\right)^2$$



$$\Rightarrow h^2 = \frac{2}{3}a^2 \Rightarrow h = \frac{\sqrt{3}}{2}a$$

$$\frac{a}{h} = \frac{2}{\sqrt{3}}$$

3. Explanation

Option (C) is correct.

$$\frac{2x}{x} = \frac{3y+8}{3y} \Rightarrow y = 8$$

$$x = 2y = 16$$

4. Explanation

Option (D) is correct.

5. Explanation

Option (D) is correct.

$$\frac{BC}{PQ} = \frac{AC}{AP} = \frac{AB}{AQ}$$

$$\frac{3}{x-3} = \frac{x-5}{3x-19}$$

$$\Rightarrow \quad X = 8 \, or \, 9$$

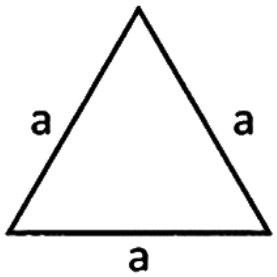
6. Explanation

Option (B) is correct.

For the given perimetre of a triangle the maximum area is enclosed by an equilateral triangle.

$$\therefore \quad 3a = 24cm$$

$$\Rightarrow \quad a = 8cm$$



$$\therefore \quad Area = \frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4} \times (8)^2 = 16\sqrt{3}\, cm^2$$

7. Explanation

Option (B) is correct.

$$\therefore \text{Interior angle of pentagon} = 180° - \frac{360°}{5} = 108°$$

$$\therefore \text{Interior angle of required polygon} = \frac{5}{6} \times 180° = 90°$$

$$= 180° - 90° = 90°$$

$\therefore$ Each interior angle of the required polygon

$\therefore \qquad Number\ of\ sjdes = \dfrac{360°}{Exterior\ angle} = \dfrac{360°}{90°} = 4$

8. Explanation

Option (D) is correct.

Interior angle = 3 x exterior angle

$180° - \dfrac{360°}{n} = 3 \times \left(\dfrac{360}{n}\right) \qquad \Rightarrow \qquad n = 8$

9. Explanation

Option (C) is correct.

$OA = 13\,cm$

$AM = 5\,cm$

$\therefore \qquad OM = \sqrt{(13)^2 - (5)^2} = 12\,cm$

10. Explanation

Option (C) is correct.

$\dfrac{n(n-3)}{2} = 54° \Rightarrow n^2 - 3n = 180° \Rightarrow n = 12$