

EXERCISE 12.1

1. An isosceles right triangle has area 8 cm^2 . The length of its hypotenuse is

- (A) $\sqrt{32} \text{ cm}$
- (B) $\sqrt{16} \text{ cm}$
- (C) $\sqrt{48} \text{ cm}$
- (D) $\sqrt{24} \text{ cm}$

Solution:

(A) $\sqrt{32} \text{ cm}$

Explanation:

Let height of triangle = h

As the triangle is isosceles,

Let base = height = h

According to the question,

Area of triangle = 8 cm^2

$\Rightarrow \frac{1}{2} \times \text{Base} \times \text{Height} = 8$

$\Rightarrow \frac{1}{2} \times h \times h = 8$

$\Rightarrow h^2 = 16$

$\Rightarrow h = 4 \text{ cm}$

Base = Height = 4 cm

Since the triangle is right angled,

Hypotenuse² = Base² + Height²

$\Rightarrow \text{Hypotenuse}^2 = 4^2 + 4^2$

$\Rightarrow \text{Hypotenuse}^2 = 32$

$\Rightarrow \text{Hypotenuse} = \sqrt{32}$

Hence, Options A is the correct answer.

2. The perimeter of an equilateral triangle is 60 m. The area is

- (A) $10\sqrt{3} \text{ m}^2$
- (B) $15\sqrt{3} \text{ m}^2$
- (C) $20\sqrt{3} \text{ m}^2$
- (D) $100\sqrt{3} \text{ m}^2$

Solution:

(D) $100\sqrt{3} \text{ m}^2$

Explanation:

Area of an equilateral triangle of side a = $\frac{\sqrt{3}}{4} a^2$

According to the question,

Perimeter of triangle = 60m

$\Rightarrow a + a + a = 60$

$\Rightarrow 3a = 60$

$\Rightarrow a = 20 \text{ m}$

Area of the triangle = $\frac{\sqrt{3}}{4} a^2$
 $= \frac{\sqrt{3}}{4} (20)^2$
 $= \frac{\sqrt{3}}{4} (400)$
 $= 100\sqrt{3}$

Hence, Options D is the correct answer.

3. The sides of a triangle are 56 cm, 60 cm and 52 cm long. Then the area of the triangle is

- (A) 1322 cm²
- (B) 1311 cm²
- (C) 1344 cm²
- (D) 1392 cm²

Solution:

(C) 1344 cm²

Explanation:

According to the question,

Sides of a triangle,

$$a = 56, b = 60, c = 52$$

$$s = (a + b + c)/2$$

$$\Rightarrow s = (56 + 60 + 52)/2$$

$$= 168/2 = 84.$$

$$\begin{aligned} \text{Area of triangle} &= \sqrt{s(s-a)(s-b)(s-c)} \\ &= \sqrt{84(84-56)(84-60)(84-52)} \\ &= \sqrt{84 \times 28 \times 24 \times 32} \\ &= 1344\text{cm}^2 \end{aligned}$$

Hence, Options C is the correct answer.

4. The area of an equilateral triangle with side $2\sqrt{3}$ cm is

- (A) 5.196 cm²
- (B) 0.866 cm²
- (C) 3.496 cm²
- (D) 1.732 cm²

Solution:

(A) 5.196 cm²

Explanation:

Area of an equilateral triangle of side a = $\frac{\sqrt{3}}{4} a^2$

According to the question,

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

$$\begin{aligned} \text{Area of triangle} &= \left(\frac{\sqrt{3}}{4}\right) a^2 \\ &= \left(\frac{\sqrt{3}}{4}\right) (2\sqrt{3})^2 \\ &= \left(\frac{\sqrt{3}}{4}\right)(12) \\ &= 3\sqrt{3} \\ &= 5.196 \end{aligned}$$

Hence, Options A is the correct answer.