EXERCISE 12.2

Write True or False and justify your answer:

1. The area of a triangle with base 4 cm and height 6 cm is 24 cm^2.

Solution:

False

Justification:

Area of triangle = ½ × Base × Altitude

= ½ × 4 × 6

= $12cm^2$

Hence, the statement "the area of a triangle with base 4 cm and height 6 cm is 24 cm^2" is False.

2. The area of △ ABC is 8 cm^2 in which AB = AC = 4 cm and ∠A = 90°.

Solution:

True

Justification:

Area of triangle = ½ × Base × Altitude

= ½ × 4 × 4

= $8cm^2$

Hence, the statement is "area of △ABC is 8 cm^2 in which AB = AC = 4 cm and ∠A = 90°" is True.

3. The area of the isosceles triangle is 5/4 $\sqrt{11}cm^2$, if the perimeter is 11 cm and the base is 5 cm.

Solution:

True

Justification:

According to the question,

Perimeter = 11cm

And base, a = 5

As the triangle is isosceles, b = c

Perimeter = 11

⇒ a + b + c = 11

⇒ 5 + b + b = 11

⇒ 5 + 2b = 11

⇒ 2b = 6

⇒ b = 3

So, we have,

a = 5, b = 3, c = 3

s = (a + b + c)/2

⇒ s = (5 + 3 + 3)/2 = 11/2

Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{\frac{11}{2}\left(\frac{11}{2}-5\right)\left(\frac{11}{2}-3\right)\left(\frac{11}{2}-3\right)}$$

$$= \sqrt{\frac{11}{2}\left(\frac{1}{2}\right)\left(\frac{5}{2}\right)\left(\frac{5}{2}\right)}$$

⇒ Area of triangle = $(5\sqrt{11})/4 cm^2$

Hence, the statement "The area of the isosceles triangle is $5/4\ \sqrt{11} cm^2$, if the perimeter is 11 cm and the base is 5 cm" is True.

4. The area of the equilateral triangle is $20\sqrt{3}\ cm^2$ whose each side is 8 cm.

Solution:

False

Justification:

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

According to the question,

Area of a triangle = $20\sqrt{3}\ cm^2$

⇒ $\sqrt{3}/4\ a^2 = 20\sqrt{3}$

⇒ $a^2 = 20 \times 4$

⇒ $a^2 = 80$

⇒ $a = 4\sqrt{5}$ cm

Hence, the statement "the area of the equilateral triangle is $20\sqrt{3}\ cm^2$ whose each side is 8 cm" is False.