Exercise 7A

Question 16:

Let a be the side of an equilateral triangle.

$\therefore$ Height of an equilateral triangle $= \frac{\sqrt{3}}{2}a$ units

Height of an equilateral triangle = 9cm [given]

$\Rightarrow \quad \frac{\sqrt{3}}{2}a = 9$

$\Rightarrow \quad a = \frac{9\times 2}{\sqrt{3}}$

$\Rightarrow \quad = \frac{9\times 2\times \sqrt{3}}{\sqrt{3}\times\sqrt{3}}$ [Rationalizing the denominator]

$\Rightarrow \quad = \frac{9\times 2\sqrt{3}}{\sqrt{3}\times\sqrt{3}}$

$\Rightarrow \quad a = 6\sqrt{3}$

$\Rightarrow \quad$ base $= 6\sqrt{3}$

Area of the equilateral triangle $= \frac{1}{2}\times$ base $\times$ height

$= \frac{1}{2}\times 6\sqrt{3}\times 9$ [$\because$ base $= 6\sqrt{3}$ and height = 9cm]

$= 27\sqrt{3}$

Area of the equilateral triangle $= 27\times 1.732 = 46.764$

$= 46.76\text{cm}^2$

[Correct to 2 places of decimal]

Question 17:

Let a=50cm, b=20cm and c=50cm.

Let us find s:

$$s = \frac{1}{2}(a+b+c)$$

$$= \left(\frac{50+20+50}{2}\right)\text{cm} = \left(\frac{120}{2}\right)\text{cm}$$

$$= 60\,\text{cm}$$

Now, area of one triangular piece of cloth

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

$$= \sqrt{60(60-50)(60-20)(60-50)}$$

$$= \sqrt{60\times 10\times 40\times 10}$$

$$= \sqrt{6\times 10\times 10\times 4\times 10\times 10}$$

$$= \sqrt{10\times 10\times 10\times 10\times 2\times 2\times 2\times 3}$$

$$= 10\times 10\times 2\sqrt{6}$$

$$= 200\sqrt{6} = 200\times 2.45 = 490\,\text{cm}^2$$

$\therefore$ area of one piece of cloth $= 490\ \text{cm}^2$

Now area of 12 pieces $= (12\times 490)\,\text{cm}^2 = 5880\,\text{cm}^2$

********** END **********