Exercise 12.1

1) Perimeter = 180 cm

length of the side = $\frac{180}{3}$ cm (cuz it is equilateral triangle)

= 60 cm

Semi Perimeter = $\frac{180}{2}$

= 90 cm

Area = $\sqrt{90(90-60)(90-60)(90-60)}$ cm^2

= $\sqrt{90 \times 30 \times 30 \times 30}$ cm^2

= $\sqrt{2430000}$ cm^2

$\Rightarrow 900\sqrt{3}$ cm^2

2) The sides of the triangle ABC are 122 m, 22 m and 120 m.

Perimeter of the triangle = 122 + 22 + 120 m

= 264 m

Semi perimeter = $\frac{264}{2}$ m

= 132 m

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

= $\sqrt{132(132-122)(132-22)(132-120)}$ m^2

= $\sqrt{132 \times 10 \times 110 \times 12}$ m^2 = $\sqrt{1742400}$ m^2

The cost of the $1320 m^2$ of the wall for advertising for 3 months $= \frac{1320 \times 5000 \times 3}{12}$ ~~$= 1320 \times 1245$~~ $= ₹$

$= ₹ 1650000$

3) The side of the wall are 15 m, 11 m and 6 m

The Perimeter $= 15 + 11 + 6$ m

$= 32$ m

The Semi Perimeter $= \frac{32}{2}$

$= 16$ m

The area that is painted $= \sqrt{s(s-a)(s-b)(s-c)}$ m^2

$= \sqrt{16(16-15)(16-11)(16-6)}$ m^2

$= \sqrt{16 \times 1 \times 5 \times 10}$ m^2

$= \sqrt{800}$ m^2

$= 20\sqrt{2}$ m^2

4) The sides of the triangle are 18 cm, 10 cm and third side is unknown as x.

So,

Perimeter of the triangle = 42 cm

So,

The length of the 3rd side = $18 + 10 + x = 42$ cm

$\Rightarrow x = 42 - 28$ cm

$\Rightarrow x = 14$ cm

Hence,

The Semi Perimeter of the triangle = $\frac{42}{2}$ cm

$= 21$ cm

Area of the triangle = $\sqrt{s(s-a)(s-b)(s-c)}$ cm^2

$= \sqrt{21(21-18)(21-10)(21-14)}$ cm^2

$= \sqrt{21 \times 3 \times 11 \times 7}$ cm^2

$= \sqrt{4851}$ cm^2

$= 21\sqrt{11}$ cm^2

5) The sides of the triangle are in the ratio of 12:17:25 and its perimeter is 540 cm. So, Let the sides be $12x$, $17x$ and $25x$.

The length of the sides $= 12x + 17x + 25x = 540$ cm

$\Rightarrow 54x = 540$ cm $\Rightarrow x = \frac{540}{54}$ cm $\Rightarrow x = 10$ cm

Hence, $12x = 12 \times 10 = 120$ cm, $17x = 17 \times 10 = 170$ cm & $25x = 25 \times 10 = 250$ cm

Semi Perimeter of the triangle $= \frac{540}{2}$ cm

$= 270$ cm

Area of the triangle $= \sqrt{s(s-a)(s-b)(s-c)}$ cm^2

$= \sqrt{270(270-250)(270-170)(270-120)}$ cm^2

$= \sqrt{270 \times 20 \times 100 \times 150}$ cm^2

$= \sqrt{81000000}$ cm^2

$= 9000$ cm^2

6) The sides of an isosceles triangle are 12 cm, 12 cm and third side is unknown so x. The Perimeter of the triangle is 30 cm.

Hence,

The length of 3rd side $= 30 - (12+12)$ cm

$= 6$ cm

Semi Perimeter of the triangle $= \frac{30}{2}$ cm

$= 15$ cm

Area of the triangle $= \sqrt{s(s-a)(s-b)(s-c)}$ cm^2

$= \sqrt{15(15-12)(15-12)(15-6)}$ cm^2

$= \sqrt{15 \times 3 \times 3 \times 9}$ cm^2

$= \sqrt{1215}$ cm^2

$= 9\sqrt{15}$ cm^2