

Ex: 12.1

1. Refer text book pg: 202.

Soln:

Let the side of an equilateral  $\Delta$  be 'a' units

i) Perimeter =  $a + a + a$

$$S = \frac{a + a + a}{2}$$

$$S = \frac{3a}{2}$$

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

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

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

$$= \sqrt{\frac{3a}{2} \left(\frac{a}{2}\right) \left(\frac{a}{2}\right) \left(\frac{a}{2}\right)}$$

$$= \sqrt{\frac{3a \times a \times a \times a}{16}}$$

$$= \frac{\sqrt{3}}{4} a^2$$

$$= \frac{\sqrt{3}}{4} a^2 \quad \checkmark$$

ii) given:

$$P = 180 \text{ cm}$$

Let side = 'a' units

$$p = 3a$$

$$180 = 3a$$

$$a = \frac{180}{3} = 60$$

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

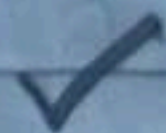
$$S = \frac{p}{2}$$

$$S = \frac{180}{2} = 90 \text{ cm}$$

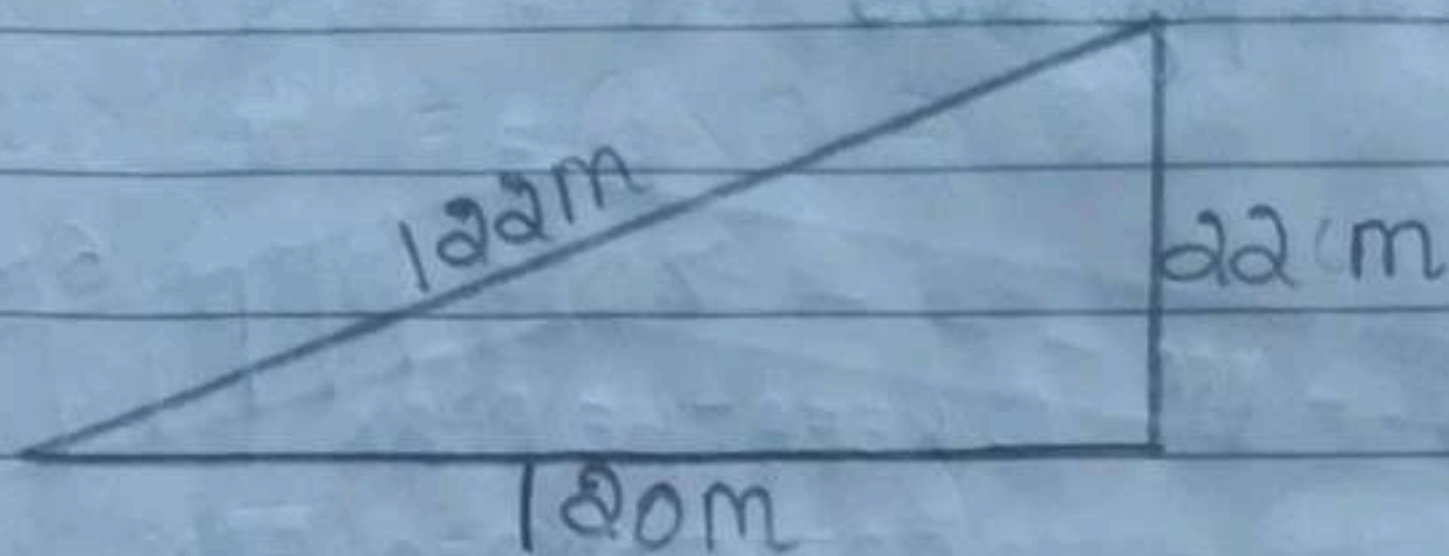
$$s = 90 \text{ cm}$$

$$\begin{aligned} A &= \sqrt{s(s-a)(s-b)(s-c)} \\ &= \sqrt{90(90-60)(90-60)(90-60)} \\ &= \sqrt{90 \times 30 \times 30 \times 30} \\ &= \sqrt{3 \times 30 \times 30 \times 30 \times 30} \\ &= 30 \times 30 \sqrt{3} \\ &= 900\sqrt{3} \text{ cm}^2 \end{aligned}$$

$$\text{Ans} = 900\sqrt{3} \text{ cm}^2$$



2. Refer text book pg: 202



Soln:

given: Let the sides be  $a, b, c$ .

Sides of a wall,  $a = 122m$

$$b = 22m$$

$$c = 120m$$

$$S = \frac{a + b + c}{2}$$

$$S = \frac{122 + 22 + 120}{2}$$

$$S = \frac{264}{2}$$

$$S = 132m$$

$$s = 132 \text{ m}$$

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

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

$$= \sqrt{11 \times 12 \times 10 \times 11 \times 12}$$

$$= \sqrt{11 \times 12 \times 10 \times 11 \times 10 \times 12}$$

$$= 11 \times 12 \times 10$$

$$= 1320 \text{ m}^2$$

$$A = 1320 \text{ m}^2 \quad \checkmark$$

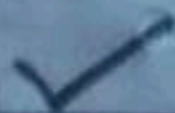
Rent for advertisement per  $\text{m}^2$  per year = ₹ 5000

Rent for advertisement per  $\text{m}^2$  for 1 month = ₹  $\frac{5000}{12}$

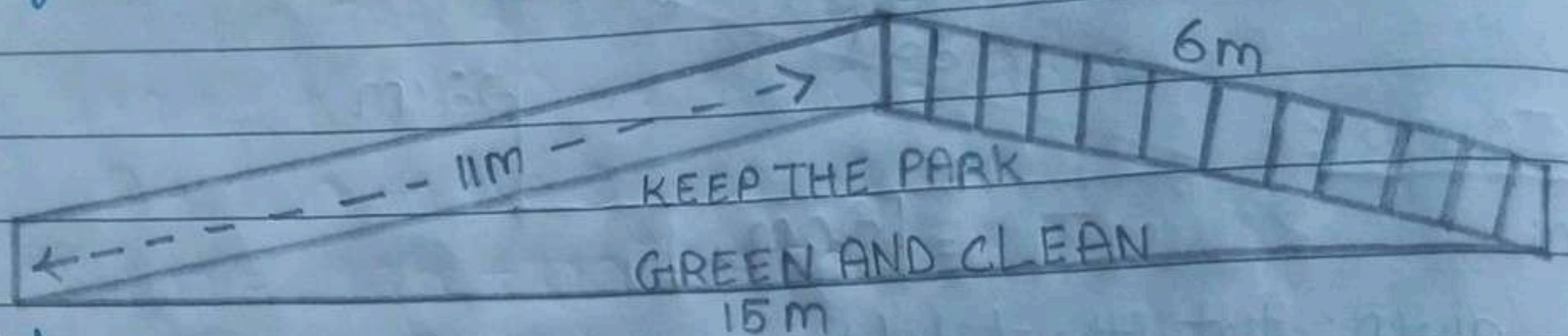
$$\text{Rent for advertisement per m}^2 \text{ in 3 months} = \frac{\text{₹ } 5000 \times 3!}{12 \text{ M}} \times 1250$$

$$\begin{aligned} &= \text{₹ } 1250 \\ \text{Rent for advertisement for } 1320 \text{ m}^2 \text{ in } 3 \text{ months} &= \text{₹ } 1250 \times 1320 \\ &= \text{₹ } 1650000 \end{aligned}$$

Ans = ₹ 1650000



3. Refer text book pg: 203



Soln:

Given:

Let the sides be  $a, b, c$ .

Sides of a wall,  $a = 15\text{ m}$

$b = 11\text{ m}$

$c = 6\text{ m}$

$$S = \frac{a+b+c}{2}$$

$$S = \frac{15+11+6}{2}$$

$$S = \frac{32}{2}$$

$$S = 16\text{ m}$$

Sides of a wall,  $a = 15\text{ m}$

$b = 11\text{ m}$

$c = 6\text{ m}$

$$S = \frac{a+b+c}{2}$$

$$S = \frac{15+11+6}{2}$$

$$S = \frac{32}{2}$$

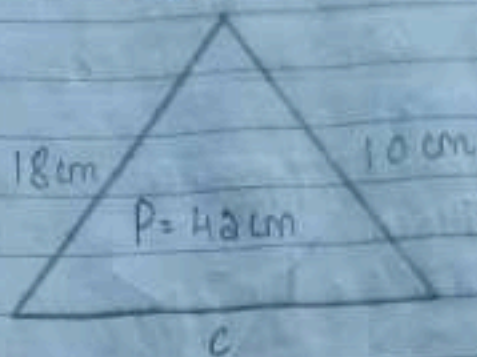
$$S = 16\text{ m}$$

$$\begin{aligned} A &= \sqrt{S(S-a)(S-b)(S-c)} \\ &= \sqrt{16(16-15)(16-11)(16-6)} \\ &= 4\sqrt{1 \times 5 \times 10} \\ &= 4\sqrt{1 \times 5 \times 5 \times 2} \\ &= 4 \times 5\sqrt{1 \times 2} \\ &= 20\sqrt{2}\text{ m}^2 \end{aligned}$$

$$\text{Ans} = 20\sqrt{2}\text{ m}^2 \quad \checkmark$$



4. Refer text book pg: 203



Soln:

given:

Sides of a  $\Delta$ ,  $a = 18 \text{ cm}$

$$b = 10 \text{ cm}$$

$$c = ?$$

$$P = a + b + c$$

$$42 \text{ cm} = 18 + 10 + c \text{ cm}$$

$$c = 42 - 28 \text{ cm}$$

$$c = 14 \text{ cm}$$

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

$$s = \frac{18 + 10 + 14}{2} = \frac{42}{2}$$

$$s = 21 \text{ cm} \quad \checkmark$$

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

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

$$= \sqrt{21 \times 3 \times 11 \times 7}$$

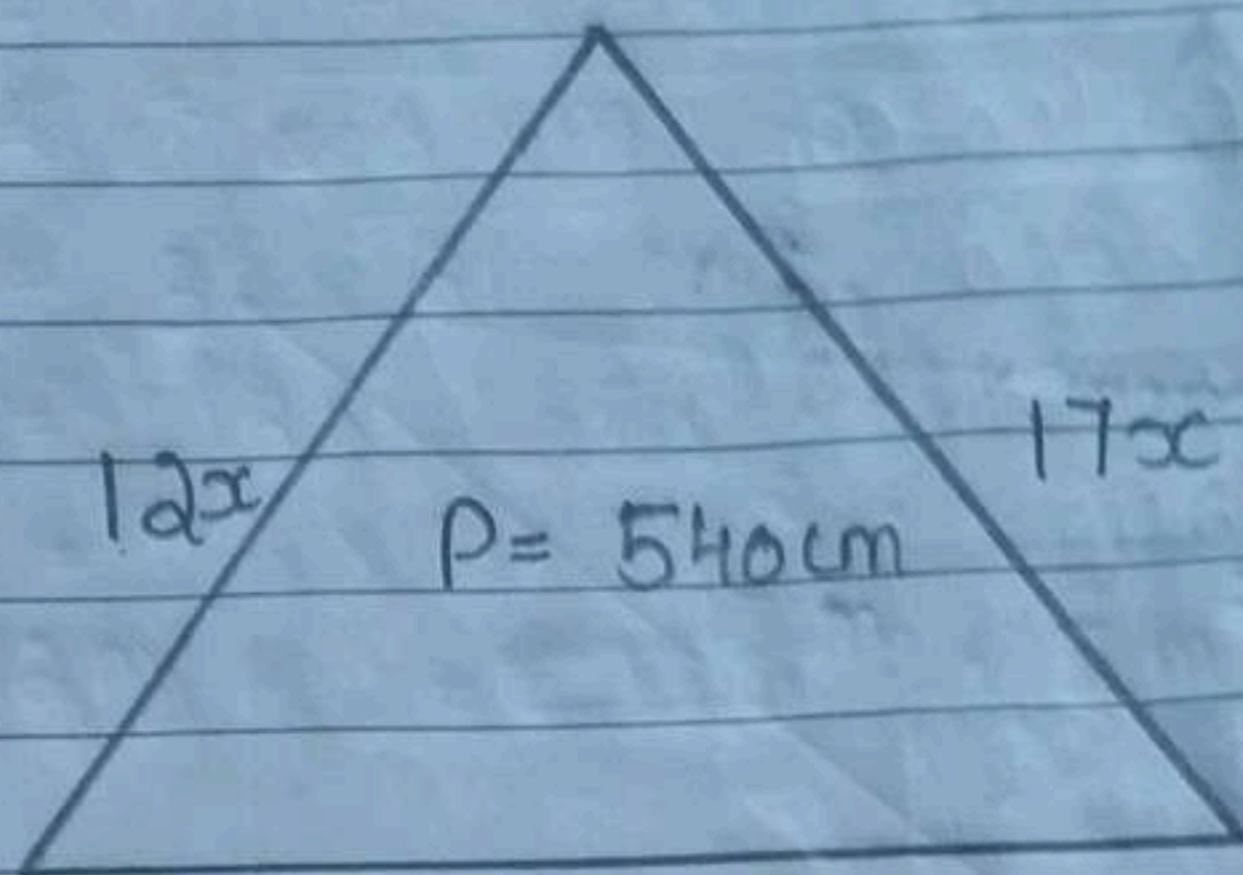
$$= \sqrt{7 \times 3 \times 3 \times 11 \times 7}$$

$$= 3 \times 7 \sqrt{11}$$

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

$$\text{Ans} = 21\sqrt{11} \text{ cm}^2 \quad \checkmark$$

5. Refer text book pg: 203



Soln:  $25x$

given: Let the sides be  $a, b, c$   
Let the sides of the  $\Delta$  be,  $a = 12x$

$$b = 17x$$

$$c = 25x$$

$$P = a + b + c$$

$$540 \text{ cm} = 12x + 17x + 25x$$

$$540 \text{ cm} = 54x$$

$$x = \frac{540}{54}$$

$$x = 10 \text{ cm}$$

$$a = 120 \text{ cm}$$

$$b = 170 \text{ cm}$$

$$c = 250 \text{ cm}$$

$$s = \frac{P}{2}$$

$$s = \frac{540}{2} = 270$$

$$a = 10 \text{ cm}$$

$$a = 120 \text{ cm}$$

$$b = 170 \text{ cm}$$

$$c = 250 \text{ cm}$$

$$s = \frac{p}{2}$$

$$s = \frac{540}{2}$$

$$s = 270 \text{ cm}$$

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

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

$$= \sqrt{270 \times 150 \times 100 \times 20}$$

$$= \sqrt{9 \times 3 \times 10 \times 5 \times 3 \times 10 \times 10 \times 10 \times 4 \times 5}$$

$$= 3 \times 3 \times 10 \times 10 \times 5 \times 2$$

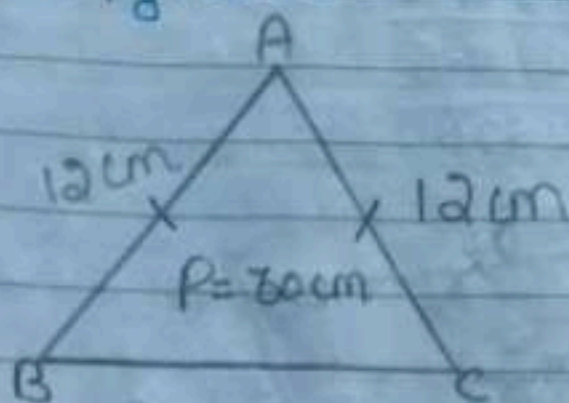
$$= 9 \times 1000$$

$$= 9000 \text{ cm}^2$$

$$\text{Ans} = 9000 \text{ cm}^2$$



6. Refer text book pg: 203



Soln:

$$a = 12 \text{ cm}$$

$$b = 12 \text{ cm}$$

$$c = ?$$

$$P = 30 \text{ cm}$$

$$c = 30 - (12 + 12)$$

$$c = 30 - 24$$

$$c = 6 \text{ cm}$$

$$s = \frac{P}{2} = \frac{30}{2} = 15$$

$$s = 15 \text{ cm}$$

$$\begin{aligned} A &= \sqrt{(s(s-a)(s-b)(s-c))} \\ &= \sqrt{(15(15-12)(15-12)(15-6))} \\ &= \sqrt{15 \times 3 \times 3 \times 9} \\ &= 3 \times 3 \sqrt{15} \\ &= 9\sqrt{15} \text{ cm}^2 \end{aligned}$$

$$\text{Ans} = 9\sqrt{15} \text{ cm}^2 \quad \checkmark$$