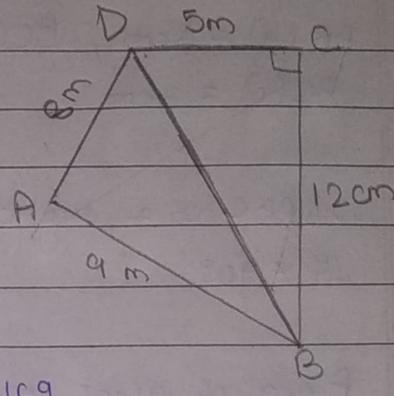
EXERCISE 12.2

1. Area of right triangle BCD =

$\frac{1}{2} \times b \times h = \frac{1}{\cancel{2}} \times 5 \times \cancel{12}^{6} = 30 m^2$



In right triangle BCD,

$BD^2 = BC^2 + CD^2$

$= (12)^2 + (5)^2 = 144 + 25 = 169$

2) $BD = \sqrt{BC^2 + CD^2}$

$= \cancel{(BD)^2}\ \sqrt{169} = 13 m$

For ΔABD,

$a = 13m$, $b = 8m$ and $c = 9m$

$s = \frac{a+b+c}{2} = \frac{13+8+9}{2} = \frac{30}{2} = 15m$

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

$= \sqrt{15(15-13)(15-8)(15-9)}$

$= \sqrt{15 \times 2 \times 7 \times 6} = \sqrt{(3 \times 5) \times 2 \times 7 \times (2 \times 3)}$

$= 3 \times 2\sqrt{35} = 6\sqrt{35} m^2$

$= 6 \times 5.916 = 35.5 m^2$

Area of the quadrilateral ABCD = Area of ΔBCD + Area of ΔABD

$= 30 m^2 + 35.5 m^2$

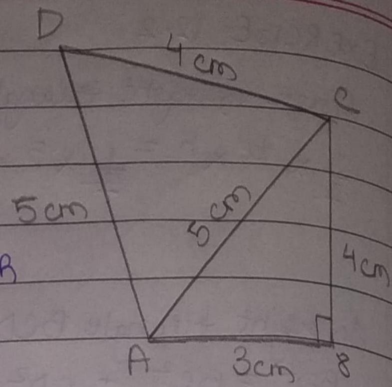
$= 65.5 m^2$

$\therefore$ The park occupies the area $65.5 m^2$.

2. In ΔABC,

$AB\,(a) = 3\,cm$, $BC\,(b) = 5\,cm$,

$AC\,(c) = 3\,cm$



$\therefore \Delta ABC$ is a right angled with

$\angle B = 90°$

Area of right angled triangle ABC $= \frac{1}{2} \times b \times h$

$= \frac{1}{\cancel{2}} \times 2 \times \cancel{4}^{2} = 4\,cm^2$

In ΔACD,

$a = 4\,cm$, $b = 5\,cm$, $c = 5\,cm$

~~so~~

$s = \frac{a+b+c}{2} = \frac{4+5+5}{2} = \frac{14}{2} = 7\,cm$

Area of the $\Delta ACD = \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{7(7-4)(7-5)(7-5)}$

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

$= 2 \times 4.6 = 9.2\,cm^2$

Area of quadrilateral ABCD = Area of ΔBCD + Area of ΔACD

$= 4\,cm^2 + 9.2\,cm^2 = 13.2\,cm^2$

Date ______
Page ______

3. Perimeter of triangle = $2s = 5+5+1 \Rightarrow s = \frac{11}{2}$ cm

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

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

$$= \sqrt{\frac{11}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{9}{2}} = \frac{3}{4}\sqrt{11} \text{ cm}^2$$

$$= \frac{3}{4} \times 3.32 = 2.49 \text{ cm}^2$$

Area of region II = $6.5 \times 1 = 6.5 \text{ cm}^2$

Area of region III = $AB^2 = AE^2 + BE^2$

$$1 = 0.25 + BE^2$$

$$\Rightarrow BE = \sqrt{0.75} = \sqrt{\frac{3}{4}}$$

Area of region IV = $\frac{1}{2} \times 6 \times 1.5 = 4.5 \text{ cm}^2$

Area of region V = 4.5 cm^2 (Regions IV and V are congruent)

Total ~~paper~~ area of paper used = $(2.49 + 6.5 + 1.3 + 4.5 + 4.5)$

$$= 19.29 \text{ cm}^2$$

4. $a = 26$ cm, $b = 28$ cm, $c = 30$ cm

$$s = \frac{a+b+c}{2} = \frac{26+28+30}{2} = \frac{84}{2} = 42 \text{ cm}$$

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

$$= \sqrt{42(42-26)(42-28)(42-30)}$$

$$= \sqrt{42 \times 16 \times 14 \times 12}$$

$$= \sqrt{(6\times7) \times 16 \times (7\times2) \times (6\times2)}$$

$= 6 \times 4 \times 7 \times 2 = 336\ cm^2$

Let the height of the parallelogram be h cm.

Area of the parallelogram = base $\times$ height

$= 28 \times h\ cm^2$

A/Q,

$28h = 336 \Rightarrow h = \frac{336}{28} \Rightarrow h = 12\ cm$

$\therefore$ The height of the parallelogram is 12 cm.