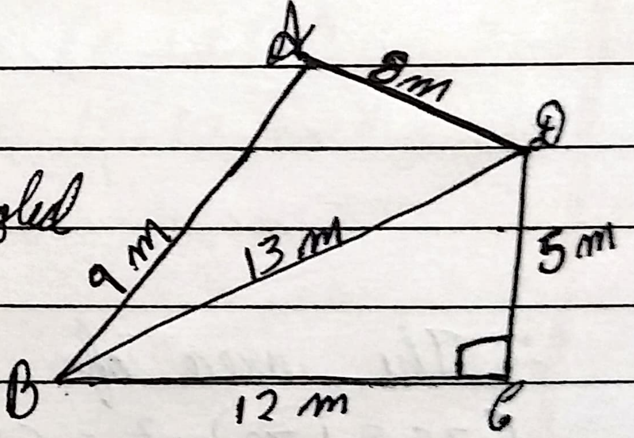
Exercise 12.2

1) Since, $\triangle BCD$ is a right angled Triangle, to find BD we apply ~~pt~~ pythogorean theroem.



According to Pythagorus theroem

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

$BD = \sqrt{12^2 + 5^2}$

$BD = \sqrt{144 + 25}$

$BD = \sqrt{169}$

$BD = 13$ m

Area of the $\Delta BCD = \frac{1}{2} \times \text{base} \times \text{height}$ m^2

$= \frac{1}{2} \times 12 \times 5$ m^2

$= 30$ m^2

Semi Perimeter $s = \frac{13+9+8}{2}$ m

$= 15$ m

Area of the $\Delta ABD = \sqrt{s(s-a)(s-b)(s-c)}$ m^2

$= \sqrt{15(15-13)(15-9)(15-8)}$ m^2

$= \sqrt{15 \times 2 \times 6 \times 7}$ m^2

$= \sqrt{1260}$ m^2

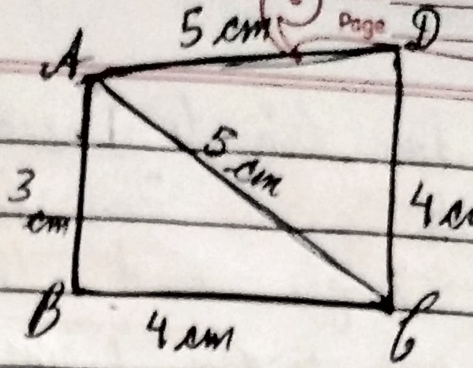
$= 6\sqrt{35}$ m^2

$= 35.5$ m^2 (approx)

$\therefore$ The area of the quadrilateral ABCD is

$(35.5 + 30)$ $m^2 = 65.5$ m^2

2) The sides of the ΔABC are 3 cm, 4 cm and 5 cm



The semi Perimeter $s = \frac{3+4+5}{2}$ cm

$= 6$ cm

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

$= \sqrt{6(6-5)(6-4)(6-3)}$ cm^2

$= \sqrt{6 \times 1 \times 2 \times 3}$ cm^2

$= \sqrt{36}$ cm^2

$= 6$ cm^2

The semi Perimeter s for $\Delta ACD = \frac{5+5+4}{2}$ cm

$= 7$ cm

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

$= \sqrt{7(7-5)(7-5)(7-4)}$ cm^2

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

$= \sqrt{84}$ cm^2

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

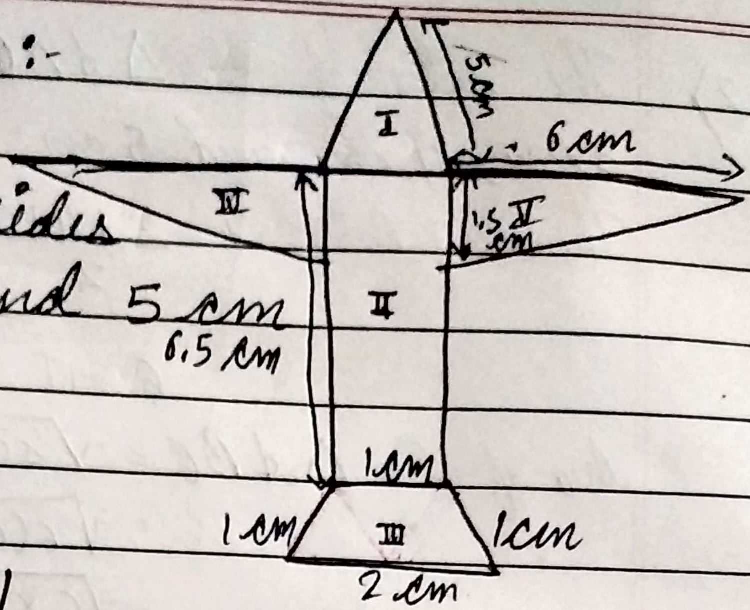
$= 9.17$ cm^2 (approx

$\therefore$ Total area of $ABCD = (6 + 9.17)$ cm^2

$= 15.17$ cm^2

3) For triangle I section:-

It is an isosceles triangle and the sides are 5 cm, 1 cm and 5 cm



Perimeter $= 5+5+1$

$= 11$ cm

So,

Semi Perimeter $= \frac{11}{2}$

$= 5.5$ cm

Using Heron's formula,

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

$= \sqrt{5.5(5.5-5)(5.5-5)(5.5-1)}$ cm^2

$= \sqrt{5.5 \times 0.5 \times 0.5 \times 4.5}$ cm^2

$= 0.75\sqrt{11}$ cm^2

$= 2.488$ cm^2 (approx)

For the quadrilateral II section:

It is a rectangle with length and breadth as 6.5 cm and 1 cm respectively

Area $= 6.5 \times 1$ cm^2

$= 6.5$ cm^2

For the quadrilateral III section:

It is a trapezoid with 3 sides as 1 cm each and the third side as 2 cm.

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Area of the trapezoid =
Area of the parallelogram + Area of the ~~equ~~ equilateral triangle.
The perpendicular height of the parallelogram will be $\left(\sqrt{1^2-(0.5)^2}\right) = 0.86$ cm
And, the area of the equilateral triangle will be $(\sqrt{3}/4 \times a^2) = 0.43$
$\therefore$ Area = $0.86 + 0.43$
$= 1.3\ cm^2$ (approx).

For triangle IV and V

These are two congruent ~~triangles~~ right angled triangle having base as 6 cm and height as 1.5 cm.
Area of IV and V = $2 \times \left(\frac{1}{2} \times 6 \times 1.5\right)$
$= 9\ cm^2$
$\therefore$ Total area $= 2.488 + 6.5 + 1.3 + 9$
$= 19.3\ cm^2$

4) Given,
It is given that the ~~p~~ area of the parallellogram and triangle are equal.
The sides of the triangle are 26 cm, 28 cm and 30 cm

The semi-perimeter $s = \dfrac{26+28+30}{2}$

$= 42\,cm$

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

$= \sqrt{42(42-26)(42-28)(42-30)}\ cm^2$

$= 336\ cm^2$

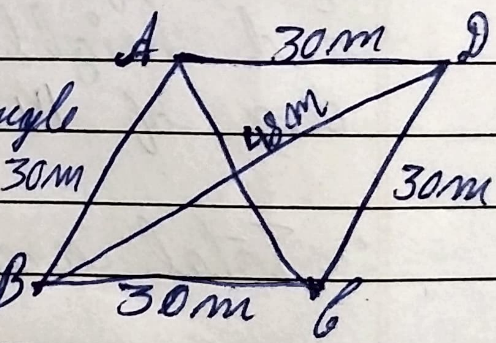
So,

Let the height of the parallelogram be h.

$\boxed{28\,cm \times h = 336\ cm^2}$ (as area of parallelogram = areas of triangle)

$h = \dfrac{336}{28}\ cm$

$= 12\ cm$



5) ~~Conside~~ Consider the triangle BCD.

Its semi perimeter $= \dfrac{48+30+30}{2}$

$= 54\,m$

Area $= \sqrt{54(54-48)(54-30)(54-30)}\ m^2$

$= 432\ m^2$

$\therefore$ Area of field $= 2 \times BCD$

$= 2 \times 432$

$= 864\ m^2$