Date ____
Page ____

Ex 12.1

1 Given
side of a signal board = a
perimeter of the signal board = 3a = 180 cm
$\therefore$ a = 60 cm
Semi perimeter of the signal board (s) = $\frac{3a}{2}$

By using Heron's formula

Area of triangular signal board will be

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

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

$= \sqrt{\frac{3a}{2} \times \frac{a}{2} \times \frac{a}{2} \times \frac{a}{2}}$

$= \sqrt{\frac{3a^4}{16}}$

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

$= \frac{\sqrt{3}}{4} \times 60 \times 60 = \sqrt{3}\ cm^2$

2 The sides of triangle ABC are 122m 22m 120m respectilly
Now perimeter (s) = $\frac{264}{2}$ = 132
using Heron's formule

area of the triangle =
$\sqrt{s(s-a)(s-b)(s-c)}$
$= \sqrt{132(132-122)(132-22)(132-120)}\ m^2$
$= \sqrt{132 \times 10 \times 110 \times 12}$
$= 1320\ m^2$

$\therefore$ The rent of one wall for 3 months = Rs.

$\left(1320 \times \frac{5000 \times 3}{12}\right)$ Rs = 1650000

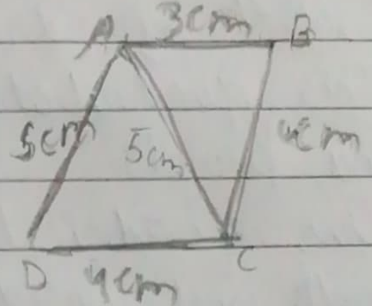
Date
Page

2 Pythagorean theorem in ΔABC,

$AC^2 = AB^2 + BC^2$

$\Rightarrow 5^2 = 3^2 + 4^2$

$\Rightarrow 25 = 25$



Thus it can be concluded that ΔABC is a right angled at B.

so area of $\Delta ABCD = (S) = \text{Perimeter} = \frac{5+5+4}{2}$ cm $= \frac{14}{2} \Rightarrow 7$

Now using Heron's formula

Area of ΔABD

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

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

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

$= 2\sqrt{21}\text{ cm}^2 = 9.17\text{ cm}^2$

Area of quadrilateral ABCD = area of ΔABC + Area of $\Delta ABD = 6\text{cm}^2 + 9.17\text{ cm}^2$

$= 15.17\text{ cm}^2$

4 It is given that the parallelogram and triangle have equal areas
The sides of the triangle are given as 26 cm, 28 cm and 30 cm
So the perimeter $= 26 + 28 + 30 = 84$ cm
and its semiperimeter $= \frac{84}{2} = 42$ cm

Now by using Heron's ~~for~~ formula area of parallelogram of a triangle,

$28\text{ cm} \times h = 336\text{ cm}^2$

$\therefore h = \frac{336}{28} = 12$

So the height of parallelogram ~~is~~ 12 cm area of the ~~triangle $28\text{ cm} \times h = 336$~~

$h =$