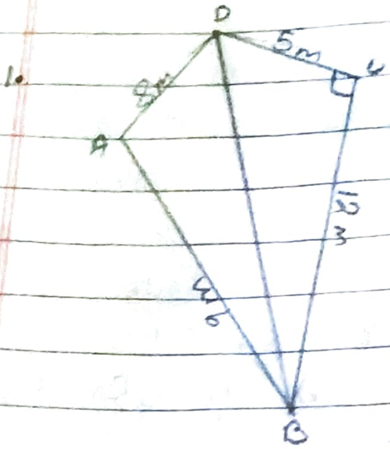
29/9/21

H.W 12.2 (1, 2, 3, 4)

1.



Given ABCD is a quadrilateral, $\angle C = 90^\circ$, $AB = 9m$, $BC = 12\,m$, $CD = 5m$ and $AD = 8m$

Join BD

$\therefore$ Area of right $\Delta BCD = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 5 \times 12 = 30\,m^2$

In right triangle BCD,

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

$\Rightarrow BD = \sqrt{BC^2 + CD^2}$
$= (12)^2 + (5)^2 = 144 + 25 = 169$

$\Rightarrow BD = \sqrt{169} = 13m$

For Δ ABD

$a = 13m$

$b = 8m$

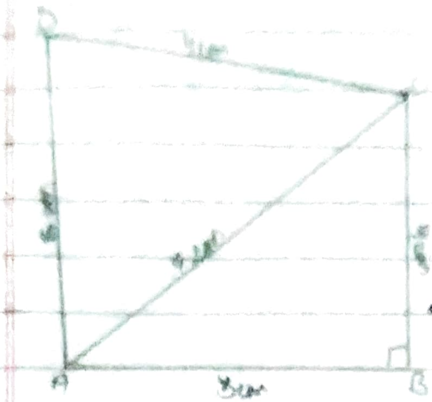
$c = 9m$

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

$= \frac{13+8+9}{2} = \frac{30}{2} = 15\,m$

$\therefore$ Area of $\Delta ABD = \sqrt{s(s-a)(s-b)(s-c)}$
$= \sqrt{15(15-13)(15-8)(15-9)}$
$= \sqrt{15 \times 2 \times 7 \times 6}$
$= \sqrt{3 \times 5 \times 2 \times 7 \times 2 \times 3}$

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

2. 

From Δ ABC

AB(a) = 3cm, BC (b) = 4cm, AC (c) = 5cm

$\Rightarrow a^2 + c^2 = b^2$

$\therefore$ Δ ABC is right angle which $\angle B = 90°$

$\therefore$ Area of right triangle ABC = ½ × b × h

= ½ × 3 × 4 = 6cm²

For Δ ACD

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

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

$= \frac{4+5+5}{2} = \frac{14}{2} = 7$ cm

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

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

$= \sqrt{7 \times 3 \times 2 \times 2} = 2\sqrt{21}$ cm²

3. For triangular Area I

a = 5cm, b = 5cm, c = 1cm

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

$= \frac{5+5+1}{2}$

$= \frac{11}{2}$ 5.5

= 5.5

Area I $= \sqrt{5.5(5.5-5)(5.5-5)(5.5-1)}$

$= \sqrt{5.5 \times .5 \times .5 \times 4.5}$

$= .5\sqrt{5.5 \times 4.5}$

Area II = 6.5 × 1 = 6.5 cm²

Area III $= \frac{1}{2} \times 1 \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times 1 \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4}$

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

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

Area V $= \frac{6 \times 1.5}{2} = 4.5 \text{ cm}^2$

$\therefore$ Total area of the paper used = Area I + Area II + Area III + Area IV + Area V

$= 2.3 + 6.5 + 1.3 + 4.5 + 4.5$

$= 19.3 \text{ cm}^2$

4. $a = 26 \text{ cm}$, $b = 28 \text{ cm}$, $c = 30 \text{ cm}$

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

$= \frac{26 + 28 + 30}{2}$

$= \frac{\cancel{84}^{42}}{\cancel{2}_{1}} = 42 \text{ cm}$

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

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

$= \sqrt{2 \times 21 \times 4 \times 4 \times 2 \times 7 \times 2 \times 6}$

$= 4 \times 2 \sqrt{21 \times 7 \times 2 \times 6}$

$= 8 \sqrt{3 \times 7 \times 7 \times 2 \times 3 \times 2}$

$= 8 \times 3 \times 7 \times 2$

$= 336 \text{ cm}^2$

Let the hight of the parallelogram be h cm.

Then, area of the parallelogram $= b \times h$

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

According to the Question,

$28h = 336 \Rightarrow h = \frac{\cancel{336}^{12}}{\cancel{28}_{1}} \Rightarrow h = 12 \text{ cm}$