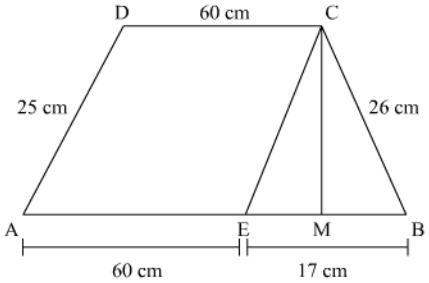
Herons Formula Ex 12.2 Q5

Answer :

We assume ABCD be the given trapezium where AB is parallel to DC.
We draw CE parallel to AD from point C.
Therefore, a parallelogram ADCE is formed having AD parallel to CE and DC parallel to AE.
AE = 60 cm; CE = 25 cm; BE = AB - AE = 17 cm
Basically we will find the area of the triangle BCE and area of the parallelogram AECD and add them to find the area of the trapezium ABCD.



Area of triangle ECB, say A_1 having sides a, b, c and s as semi-perimeter is given by

$$A_1 = \sqrt{s(s-a)(s-b)(s-c)}$$

Where, a = EB = 17 cm; b = EC = 25 cm; c = BC = 26 cm

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

$$s = \frac{17+25+26}{2}$$

$$s = 34 \text{ cm}$$

$$A_1 = \sqrt{34(34-17)(34-25)(34-26)}$$

$$A_1 = \sqrt{34(17)(9)(8)}$$

$$A_1 = \sqrt{41616}$$

$$A_1 = 204 \text{ cm}^2$$

Here we need to find the height of the parallelogram AECD which is CM to calculate area of AECD.

$$\text{Area of traingle BCE} = \frac{1}{2}(\text{Base} \times \text{Height})$$

Where, BE = Base = 17 cm ; Height = CM = h

$$\text{Area of traingle BCE} = \frac{1}{2}(\text{Base} \times \text{Height})$$

$$204 = \frac{1}{2}(17 \times h)$$

$$204 \times 2 = (17 \times h)$$

$$h = \frac{204 \times 2}{17}$$

$$h = 24 \text{ cm}$$

Thus area of parallelogram will be,

$A_2 = b \times h$

$= 60 \times 24$

$= 1440\ cm^2$

Total area of the trapezium will be

$A = A_1 + A_2$

$= 204 + 1440$

$= 1644\ cm^2$

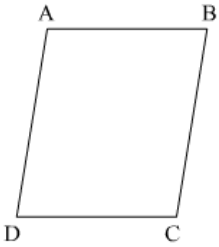
Herons Formula Ex 12.2 Q6

Answer :

We assume ABCD be the given rhombus having

AB = BC = CD = DA

Diagonal DB divides rhombus into two equal triangles BDC and ADB



Perimeter of rhombus ABCD, say P is 80 m

$P = AB+BC+CD+DA$

$80 = 4AB$

$AB = 20$ m

Area of triangle BDC, say A_1 having sides a, b, c and s as semi-perimeter is given by

$A_1 = \sqrt{s(s-a)(s-b)(s-c)}$

Where,

a = BD = 24 m; b = DC = 20 m; c = BC = 20 m

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

$$s = \frac{24+20+20}{2}$$

$$s = 32$$

$$A = \sqrt{32(32-24)(32-20)(32-20)}$$

$$A = \sqrt{32(8)(12)(12)}$$

$$A = \sqrt{36864}$$

$$A = 192 \text{ m}^2$$

Area of rhombus ABCD, say A

A = Area of triangle BDC + Area of triangle BDA

$$A = 2A_1$$

$$A = 2 \times 192$$

$$\boxed{A = 384 \text{ m}^2}$$

********** END **********