Mensuration-I area of a trapezium and a polygon Ex 20.1 Q13

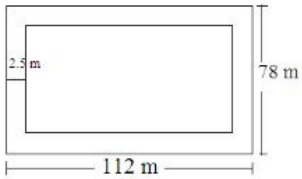
Answer :

Given :

The length of a rectangular grassy plot is 112 m and its width is 78 m.

Also, it has a gravel path of width 2.5 m around it on the sides .

Its rough diagram is given below :



Length of the inner rectangular field $= 112 - (2 \times 2.5) = 107$ m

The width of the inner rectangular field $= 78 - (2 \times 2.5) = 73$ m

$\therefore$ Area of the path = (Area of the rectangle with sides 112 m and 78 m)

$-$ (Area of the rectangle with sides 107 m and 73 m)

$= (112 \times 78) - (107 \times 73)$

$= 8736 - 7811$

$= 925$ m^2

Now, the cost of constructing the path is Rs 4.50 per square meter.

$\therefore$ Cost of constructing the complete path $= 925 \times 4.50 =$ Rs 4162.5

Thus, the total cost of constructing the path is Rs 4162.5

Mensuration-I area of a trapezium and a polygon Ex 20.1 Q14

Answer :

Given :

Side of the rhombus $= 20$ cm

Length of a diagonal $= 24$ cm

We know : If d_1 and d_2 are the lengths of the diagonals of the rhombus, then

side of the rhombus $= \frac{1}{2}\sqrt{d_1^2 + d_2^2}$

So, using the given data to find the length of the other diagonal of the rhombus :

$20 = \frac{1}{2}\sqrt{24^2 + d_2^2}$

$40 = \sqrt{24^2 + d_2^2}$

Squaring both sides to get rid of the square root sign :

$40^2 = 24^2 + d_2^2$

d_2^2=1600-576=1024

d_2=$\sqrt{1024}$=32 cm

$\therefore$ Area of the rhombus= $\frac{1}{2}\left(24 \times 32\right) = 384$ cm^2

Mensuration-I area of a trapezium and a polygon Ex 20.1 Q15

Answer :

Given:
Length of the square field = 4 m

$\therefore$ Area of the square field = $4 \times 4 = 16\ m^2$

Given: Area of the rhombus = Area of the square field
Length of one diagonal of the rhombus = 2 m

$\therefore$ Side of the rhombus = $\frac{1}{2}\sqrt{d_1^2 + d_2^2}$

And, area of the rhombus = $\frac{1}{2} \times \left(d_1 \times d_2\right)$

$\therefore$ Area:

$16 = \frac{1}{2}\left(2 \times d_2\right)$

d_2 = 16 m
Now, we need to find the length of the side of the rhombus.

$\therefore$ Side of the rhombus = $\frac{1}{2}\sqrt{2^2 + 16^2} = \frac{1}{2}\sqrt{260} = \frac{1}{2}\sqrt{4 \times 65} = \frac{1}{2} \times 2\sqrt{65} = \sqrt{65}$ m

Also, we know: Area of the rhombus = Side $\times$ Altitude

$\therefore$ $16 = \sqrt{65} \times$ Altitude

Altitude = $\frac{16}{\sqrt{65}}$ m

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