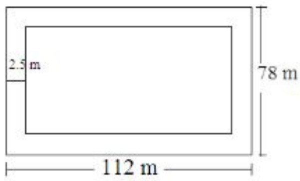
Mensuration-I area of a trapezium and a polygon Ex 20.1 Q13

**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)
$= (112 \times 78) - (107 \times 73)$
$= 8736 - 7811$
$= 925 \text{ m}^2$
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 $= \frac{1}{2}\left(24 \times 32\right) = 384 \text{ cm}^2$

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 $= 4\times4 = 16\ \text{m}^2$
**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$=\frac{1}{2}\times\left(d_1\times d_2\right)$
$\therefore$ $A$rea:
$16=\frac{1}{2}\left(2\times d_2\right)$
$d_2$=16 m
Now, we need to find the length of the side of the rhombus.
$\therefore$ Side of the rhombus $=\frac{1}{2}\sqrt{2^2+16^2}=\frac{1}{2}\sqrt{260}=\frac{1}{2}\sqrt{4\times65}=\frac{1}{2}\times2\sqrt{65}=\sqrt{65}$ m
Also, we know: Area of the rhombus = Side $\times$ Altitude
$\therefore$ 16=$\sqrt{65}\times$Altitude
Altitude$=\frac{16}{\sqrt{65}}$ m

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