



Mensuration-I area of a trapezium and a polygon Ex 20.2 Q15

Answer :

Given:

Area of the trapezium = 1586 cm^2

Distance between the parallel sides = 26 cm

And, length of one parallel side = 38 cm

Let us suppose the length of the other side to be $x \text{ cm}$.

Now, area of the trapezium = $\frac{1}{2} \times (\text{Sum of the parallel sides}) \times (\text{Distance between the parallel sides})$

$$\Rightarrow 1586 = \frac{1}{2} \times (38 + x) \times (26)$$

$$\Rightarrow 1586 = \frac{26}{2} \times (38 + x)$$

$$\Rightarrow 13 \times (38 + x) = 1586$$

$$\Rightarrow 38 + x = \frac{1586}{13} = 122$$

$$\Rightarrow x = 122 - 38 = 84 \text{ cm}$$

Hence, the length of the other parallel side is 84 cm .

Mensuration-I area of a trapezium and a polygon Ex 20.2 Q16

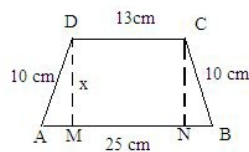
Answer :

Given:

The parallel sides of a trapezium are 25 cm and 13 cm .

Its nonparallel sides are equal in length and each is equal to 10 cm .

A rough sketch for the given trapezium is given below:



In above figure, we observe that both the right angle triangles AMD and BNC are congruent

$AD = BC = 10 \text{ cm}$

$DM = CN = x \text{ cm}$

$\angle DMA = \angle CNB = 90^\circ$

Hence, the third side of both the triangles will also be equal.

$\therefore AM = BN$

Also, $MN = 13$

Since $AB = AM + MN + NB$:

$$\therefore 25 = AM + 13 + BN$$

$$AM + BN = 25 - 13 = 12 \text{ cm}$$

$$\text{Or, } BN + BN = 12 \text{ cm} \quad (\text{Because } AM = BN)$$

$$2 BN = 12$$

$$BN = \frac{12}{2} = 6 \text{ cm}$$

$$\therefore AM = BN = 6 \text{ cm.}$$

Now, to find the value of

x , we will use the Pythagoras theorem in the right angle triangle AMD, whose sides are 10

$$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Altitude})^2$$

$$(10)^2 = (6)^2 + (x)^2$$

$$100 = 36 + x^2$$

$$x^2 = 100 - 36 = 64$$

$$x = \sqrt{64} = 8 \text{ cm}$$

\therefore Distance between the parallel sides = 8 cm

\therefore Area of trapezium = $\frac{1}{2} \times (\text{Sum of parallel sides}) \times (\text{Distance between parallel sides})$

$$= \frac{1}{2} \times (25 + 13) \times (8)$$

$$= 152 \text{ cm}^2$$

Mensuration-I area of a trapezium and a polygon Ex 20.2 Q17

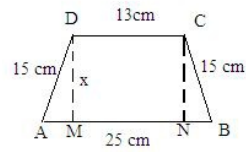
Answer :

Given:

Parallel sides of a trapezium are 25 cm and 13 cm.

Its nonparallel sides are equal in length and each is equal to 15 cm.

A rough sketch of the trapezium is given below:



In above figure, we observe that both the right angle triangles AMD and BNC are similar. This is because both have two common sides as 15 cm and the altitude as x and a right angle. Hence, the remaining side of both the triangles will be equal.

$$\therefore AM=BN$$

$$\text{Also } MN=13$$

$$\text{Now, since } AB=AM+MN+NB:$$

$$\therefore 25=AM+13+BN$$

$$AM+BN=25-13=12 \text{ cm}$$

$$\text{Or, } BN+BN=12 \text{ cm} \quad (\text{Because } AM=BN)$$

$$2 BN=12$$

$$BN=\frac{12}{2}=6 \text{ cm}$$

$$\therefore AM=BN=6 \text{ cm}$$

Now, to find the value of x, we will use the Pythagorean theorem in the right angle triangle

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