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

Answer :

Given:
Area of the trapezium $= 1586\ \text{cm}^2$
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 cm.
Now, area of the trapezium$= \frac{1}{2} \times$(Sum of the parallel sides)$\times$(Distance between the parallel

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

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

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

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

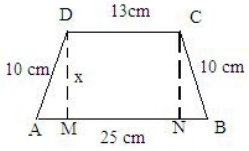
$\Rightarrow x = 122\text{-}38 = 84$ cm

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:

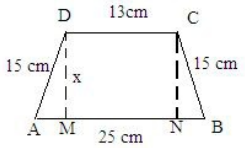


In above figure, we observe that both the right angle trangles AMD and BNC are congrue
AD $=$ BC $= 10$ cm
D $=$ CN $= x$ cm
$\angle$DMA $= \angle$CNB $= 90^\circ$
Hence, the third side of both the triangles will also be equal.
$\therefore$ AM=BN
Also, MN=13
Since AB = AM+MN+NB:
$\therefore$ 25=AM+13+BN
AM+BN=25-13=12 cm
Or, BN+BN=12 cm (Because AM=BN)
2 BN=12
BN$= \frac{12}{2} = 6$ cm
$\therefore$ AM $=$ BN $= 6$ cm.
Now, to find the value of
x, we will use the Pythagoras theorem in the right angle triangle AMD, whose sides are 10
(Hypotenuse)^2=(Base)^2+(Altitude)^2
$(10)^2 = (6)^2 + (x)^2$
$100 = 36 + x^2$
$x^2 = 100\text{-}36 = 64$
$x = \sqrt{64} = 8$ cm
$\therefore$ Distance between the parallel sides $= 8$ cm
$\therefore$ Area of trapezium $= \frac{1}{2} \times$(Sum of parallel sides)$\times$(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 skech 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 ang
Hence, the remaining side of both the triangles will be equal.
$\therefore$ AM=BN
Also MN=13
Now, since AB=AM+MN+NB:
$\therefore$ 25=AM+13+BN
AM+BN=25-13=12 cm
Or, BN+BN=12 cm (Because AM=BN)
2 BN=12
BN= $\frac{12}{2}$ = 6cm
$\therefore$ AM=BN=6 cm

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

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