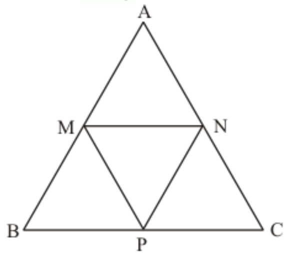
Quadrilaterals Ex 14.4 Q8

Answer :

We have ΔABC as follows:



M, *N* and *P* are the mid-points of sides *AB* ,*AC* and *BC* respectively.

Also, $MN = 3\text{cm}$, $NP = 3.5\text{cm}$ and $MP = 2.5\text{cm}$

We need to calculate *BC*, *AB* and *AC*.

In ΔABC, *M* and *N* are the mid-points of *AB* and *AC* respectively.

Theorem states, the line segment joining the mid-points of any two sides of a triangle is parallel to the third side and equal to half of it.

Therefore,

$$MN = \frac{1}{2}BC$$
$$BC = 2MN$$
$$BC = 2(3\text{ cm})$$
$$BC = \boxed{6\text{ cm}}$$

Similarly,

$$NP = \frac{1}{2}AB$$
$$AB = 2NP$$
$$AB = 2(3.5\text{cm})$$
$$AB = \boxed{7\text{cm}}$$

And

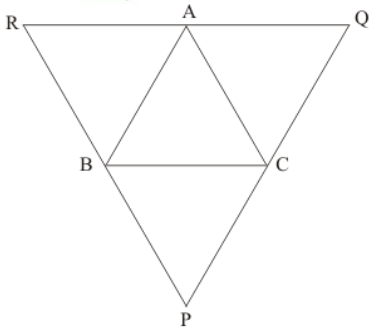
$$MP = \frac{1}{2}AC$$
$$AC = 2MP$$
$$AC = 2(2.5\text{cm})$$
$$AB = \boxed{5\text{cm}}$$

Hence, the measure for *BC*, *AB* and *AC* is $\boxed{6\text{cm}}$, $\boxed{7\text{cm}}$ and $\boxed{5\text{cm}}$ respectively.

Quadrilaterals Ex 14.4 Q9

Answer :

We have ΔABC as follows:



Through *A*,*B* and *C* lines are drawn parallel to *BC*,*CA* and *AB* respectively intersecting at *P*,*Q* and *R* respectively.

We need to prove that perimeter of ΔPQR is double the perimeter of ΔABC.

$AB \parallel CQ$ and $BC \parallel AQ$

Therefore, $ABCQ$ is a parallelogram.

Thus, $BC = AQ$

Similarly,

$ARBC$ is a parallelogram.

Thus, $BC = AR$

Therefore,

$AQ = AR$

Then, we can say that *A* is the mid-point of *QR*.

Similarly, we can say that *B* and *C* are the mid-point of *PR* and *PQ* respectively.

In ΔPQR, $AC \parallel PR$

Theorem states, the line drawn through the mid-point of any one side of a triangle is parallel to the another side, intersects the third side at its mid-point.

Therefore, $AC = \frac{1}{2} PR$

$PR = 2AC$

Similarly,

$BC = \frac{1}{2} QR$

$QR = 2BC$

And $AB = \frac{1}{2} PQ$

$PQ = 2AB$

$PQ + QR + PR = 2AB + 2BC + 2CA$

$PQ + QR + PR = 2(AB + BC + AC)$

Perimeter of ΔPQR is double the perimeter of ΔABC

Hence proved.

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