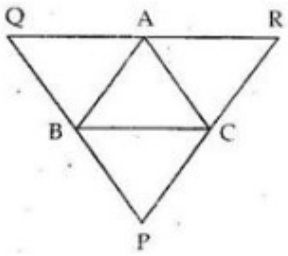
Exercise 9B

Question 21:

Given : A ΔABC, in which through points A, B and C, lines QR, QP and RP have been drawn parrallel to BC, AC and AB of ΔABC respectively.



To Prove : Perimeter of $\Delta PQR = 2$(Perimeter of ΔABC)

Proof :

Since AR $\parallel$ BC and AB $\parallel$ RC [Given]

So, ABCR is a parallelogram. Therefore

$$AR = BC \quad \text{.....(i)}$$

Also, AQ $\parallel$ BC and QB $\parallel$ AC

So, AQBC is a parallelogram. Therefore

$$QA = BC \quad \text{.....(ii)}$$

Adding both side of (i) and (ii), we get

$$AR + QA = BC + BC$$

$$\Rightarrow \quad QR = 2BC$$

$$\Rightarrow \quad BC = \frac{QR}{2}$$

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

Similarly, we can prove $AB = \frac{1}{2}RP$ and $AC = \frac{1}{2}PQ$

So, Perimeter of $\Delta PQR = PQ + QR + RP$

$$= 2AC + 2BC + 2AB$$

$$= 2(AC + BC + AB)$$

$$= 2(\text{Perimeter of } \Delta ABC)$$

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