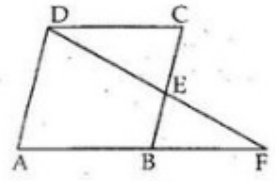
Exercise 9B

Question 19:



Given : A parrallelogram ABCD in which E is the mid point of side BC. DE and AB when produced meet at F.

To Prove : $AF = 2AB$

Proof : In ΔDEC and ΔFEB

$\angle DEC = \angle FEB$ [Vertically opposite angles]

$\angle DCE = \angle FBE$ [alternate angles]

$CE = EB$ [Given]

Thus by Angle-Angle-Side criterion of congruence, we have

$\Delta DEC \cong \Delta FEB$ [By AAS]

The corresponding parts of the congruent triangles are equal.

$\therefore$ $DC = FB$ [By cpct]

So, $AF = AB + BF$

$= AB + DC$

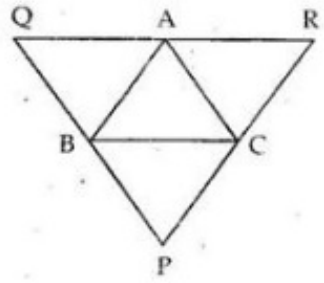
$= AB + AB$

$= 2AB$

$\therefore AF = 2AB$

Question 20:

Given : A ΔABC in which through points A, B and C, lines QR, QP and RP are drawn parallel to BC, CA and AB.



To prove : $BC = \frac{1}{2} QR$

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

$$AR + QA = BC + BC$$

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

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

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

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