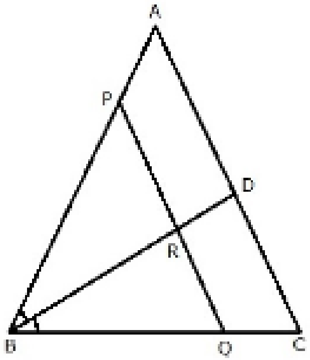
Exercise 4A

Question 8:
Given ABC, the bisector of B meets AC at D, line PQ || AC meets AB, BC and BD at P, Q, R respectively.
To Prove : PR x BQ = QR x BP



Proof: In ΔBQP,

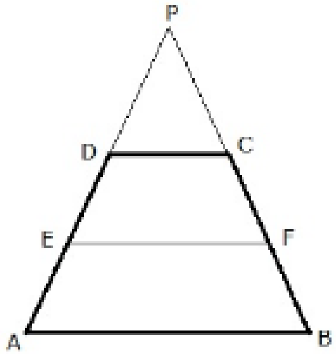
BR is the bisector of $\angle B$

$$\therefore \frac{BQ}{BP} = \frac{QR}{PR}$$

$$\Rightarrow PR \times BQ = QR \times BP$$

Therefore, by Basic proportionality theorem

Question 9:
Let ABCD be the trapezium and let E and F be the midpoints of AD and BC respectively.
Const: Produce AD and BC to meet at P



In ΔPAB, $DC \parallel AB$

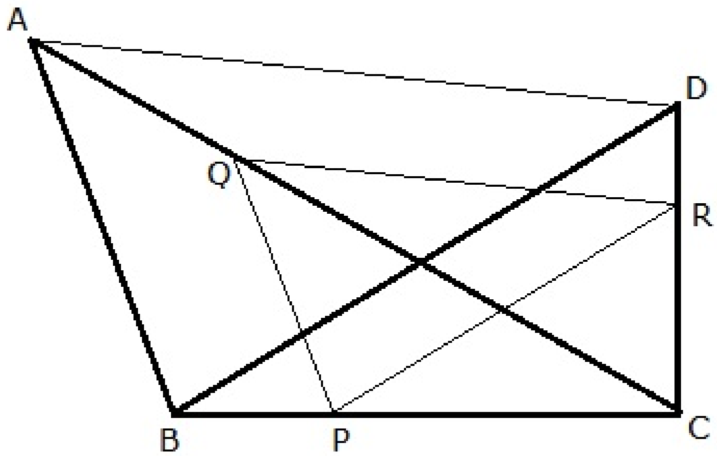
$$\therefore \frac{PD}{DA} = \frac{PC}{CB} \Rightarrow \frac{PD}{2DE} = \frac{PC}{2CF}$$

$$= \frac{PD}{DE} = \frac{PC}{CF}$$

$$\Rightarrow DC \parallel EF$$

$$\Rightarrow EF \parallel DC \text{ and } EF \parallel AB$$

Question 10:



Given: ΔABC and ΔDBC lie on the same side of BC. P is a point on BC, PQ || AB and PR || BD are drawn meeting AC at Q and CD at R respectively.
To Prove: QR || AD

Proof: In ΔABC

$PQ \parallel AB$

$$\Rightarrow \frac{CP}{PB} = \frac{CQ}{QA} --- (1)(\text{by thales theorem})$$

In ΔBCD, $PR \parallel BD$

$$\therefore \frac{CP}{PB} = \frac{CR}{RD} --- (2)(\text{by thales theorem})$$

From (1) & (2), we get

$$\frac{CQ}{QA} = \frac{CR}{RD}$$

Hence, in ΔACD, Q and R the points in AC and CD such that

$$\therefore \frac{CQ}{QA} = \frac{CR}{RD}$$

QR || AD (by the converse of Thales theorem)

Hence proved.

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