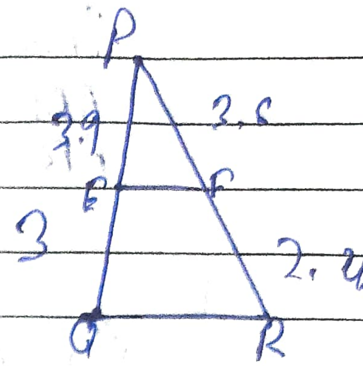
2

In ΔPQR $PE \parallel EQ$ and $PF \parallel FR$.



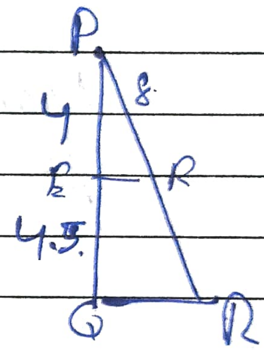
$$\frac{PE}{EQ} = \frac{PF}{FR}$$

$$\frac{\overset{1.3}{\cancel{3.9}}}{\cancel{3}} = \frac{\overset{3}{\cancel{3.6}}}{\underset{2}{\cancel{2.4}}}$$

$$1.3 \neq \frac{3}{2}$$

It is not parallel.

(ii) $PE = \frac{4}{4.5} = \frac{40}{45} = \frac{8}{9}$



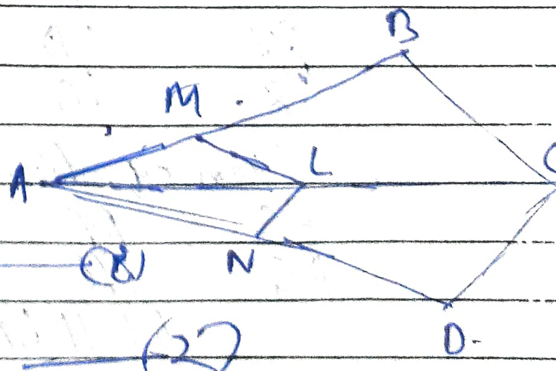
and $\frac{PF}{FR} = \frac{8}{9}$ $EF \parallel QR$

(iii) $PE = \frac{0.18}{1.28 - 0.18} = \frac{0.18}{1.10} = \frac{9}{55}$

and $\frac{PF}{FR} = \frac{0.36}{2.56 - 0.36} = \frac{0.36}{2.20} = \frac{9}{55}$

Since $\frac{PE}{EQ} = \frac{PF}{FR}$, $EF \parallel QR$

3



In

$\cancel{\frac{AM}{AB} = \frac{AN}{AD}}$ $\cancel{\ln \Delta ABC}$ $\frac{AM}{AB} = \frac{AL}{AC}$ — (1)

in ΔADC $\frac{AN}{AD} = \frac{AL}{AC}$ — (2)

From eq (i) and eq (2) proved that

$\frac{AM}{AB} = \frac{AN}{AD}$ ~~[by h~~

4 In $\triangle BAC$ $DE \parallel AC$

$\therefore \frac{BE}{EC} = \frac{BD}{AD}$ ——— (i) [by basic proportionality theorem]

Similarly in $\triangle BAE$, $DF \parallel AE$

$\therefore \frac{BF}{FE} = \frac{BD}{DA}$ ——— (ii) [By proportionality Theorem]

From equations (i) and (ii) we get

$\frac{BE}{EC} = \frac{BF}{FE}$ Hence proved

5 In $\triangle POQ$

$DE \parallel OQ$

$\frac{PE}{EQ} = \frac{PD}{DO}$

In $\triangle ROR$,

$DF \parallel OR$

$\frac{PF}{FR} = \frac{PD}{DO}$

From equation (i) and (ii), we get

$\frac{PE}{EQ} = \frac{PF}{FR}$

$EF \parallel QR$

6 $AB \parallel PQ$

$\therefore \frac{OA}{AP} = \frac{OB}{BQ}$ ....(i) By Basic proportionality Theorem

and $AC \parallel PR$

$\therefore \frac{OA}{AP} = \frac{OC}{CR}$ (ii).

From equations (i) and (ii), we get:

$\frac{OB}{BQ} = \frac{OC}{CR}$

$\therefore BC \parallel QR$

[By converse of proportionality Theorem]

and ~~B~~ $AC \parallel PR$

$\therefore \frac{OA}{AP} = \frac{OC}{CR}$ ....(ii)

From equations (i) and (ii), we get:

$\frac{OB}{BQ} = \frac{OC}{CR}$

$\therefore BC \parallel QR$

[By convers of Basic proportionality Theorem]

7 Given: A $\triangle ABC$ in which D is the mid-point of AB and $DE \parallel BC$

To Prove: $AE = EC$

Proof: In $\triangle ABC$, $DE \parallel BC$

$$\frac{AD}{DB} = \frac{AE}{EC}$$

But, $AD = DB$

$$\Rightarrow \frac{AD}{DB} = 1$$

$$\Rightarrow 1 = \frac{AE}{EC} \Rightarrow AE = EC$$

Hence, DE bisects AC.

8 The given figure shows a $\triangle ABC$ in which D and E are mid points of sides AB and AC respectively

$$\therefore \frac{AD}{DB} = 1$$

and $\frac{AE}{EC} = 1$

$$\Rightarrow \frac{AD}{DB}, \frac{AE}{EC} = 1$$

$$\Rightarrow \frac{AD}{DB} = \frac{AE}{EC}$$

[by converse of Proportionality Theorem]

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Page

9. Given: ABCD is a trapezium in which $AB \parallel DC$

To prove: $\frac{AO}{BO} = \frac{CO}{DO}$

Construction: Draw $EO \parallel DC$

Proof In ABD

$EO \parallel DC$ [By const]
$DC \parallel AB$ [Given]
$EO \parallel AB$

$\frac{AE}{ED} = \frac{BO}{DO}$

In ΔADC, $EO \parallel DC$ = $\frac{AE}{ED} = \frac{AO}{CO}$

From eq (i) and (ii)

$\frac{BO}{DO} = \frac{AO}{CO}$ or $\frac{AO}{BO} = \frac{CO}{DO}$

10 $\frac{AO}{BO} = \frac{CO}{OD}$ [Given]

$\therefore \frac{AO}{OC} = \frac{BO}{OD}$. (i)

In ΔDAB, $EO \parallel AB$ [By construction]

$\therefore \frac{DE}{EA} = \frac{DO}{OB}$ [By Basic Proportionality Theorem]