AB   AD

4. In $\Delta BAC$

$AE \parallel DC$

$\frac{BE}{EC} = \frac{BD}{AD}$ [by BPT]

In $\Delta BAE$

$DF \parallel AE$

$\frac{BF}{FE} = \frac{BD}{AD}$

(by BPT)

From equation (i) and (ii) we got $\frac{BF}{FE} = \frac{BE}{EC}$

5. In $\Delta POQ$

$DE \parallel OQ$

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

In $\Delta POR$

$DF \parallel OR$

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

From equation (i) and (ii) we got $\frac{PE}{EQ} = \frac{PF}{FR}$

$\therefore$ $EF \parallel QR$ (proved)

6. Given: AB ∥ PQ

$$\frac{OA}{AP} = \frac{OB}{BQ} \quad \text{— (i)}$$

AC ∥ PR

∴

$$\frac{OA}{AP} = \frac{OC}{CR} \quad \text{— (ii)}$$

from equ I and (ii) we get $\frac{OB}{BQ} = \frac{OC}{CR}$ (proved)

8. Given: In △ABC, D,E are midpoints of AB & AC

To prove: DE ∥ BC

Proof - $\frac{AD}{BD} = 1$ (D is mid) $\frac{AE}{EC} = 1$ (E is mid)

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

By converse of BPT, DE ∥ BC

7. Given: In △ABC in which D is midpoint of AB and DE ∥ BC

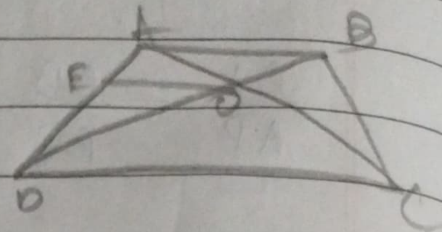
To prove - AE = EC

proof - In △ABC, DE ∥ BC

$$\frac{AD}{DB} = \frac{AE}{EC} \qquad \frac{AD}{DB} = 1 \qquad \frac{AE}{EC} = 1$$

But AD = DB  AE = EC  Hence, DE bisects

9. Given - ABCD is trapezium, AB ∥ DC




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

Proof - In △ABD, EO ∥ DC

DC ∥ AB

⇒ EO ∥ AB $\quad \frac{AE}{ED} = \frac{BO}{DO}$ — (i)

In △ADC, EO ∥ DC

$\frac{AE}{ED} = \frac{AO}{CO}$ — (ii)

From Eq (i) and (ii)

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

10. Given - $\frac{AO}{BO} = \frac{CO}{DO}$ ABCD is a quadrilateral

To prove - ABCD is a trapezium

Construction - EF ∥ AB

Proof - $\frac{AO}{BO} = \frac{CO}{DO}$ In △ABD

EO ∥ AB

⇒ $\frac{AO}{CO} = \frac{BO}{DO}$ —(i) $\quad \frac{AE}{ED} = \frac{BO}{DO}$ —(i) (by BPT) —(ii)

From (i) and (ii) we got, $\frac{AE}{ED} = \frac{AO}{CO}$

In $\triangle ADC$

$$\frac{AE}{ED} = \frac{AO}{OC}$$

$EO \parallel DC$ (by converse of BPT) — (iii)

$EO \parallel AB$ (by construction) — (iv)

From equ (iii) and (iv)

$AB \parallel DC$

So, ABCD is a trapezium.