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Q4 Ans - In $\triangle BAC$, $DE \parallel AC$

$\therefore \frac{BE}{EC} = \frac{BD}{AD}$ (i)

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

$\therefore \frac{BF}{FE} = \frac{BD}{DA}$ (ii)

From equation (i) & (ii) we get

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

Q5 Ans - In $\triangle POQ$,

$DE \parallel OQ$

$\frac{PE}{EQ} = \frac{PD}{DO}$ (i)

In $\triangle POR$,

$DF \parallel OR$

$\frac{PF}{FR} = \frac{PD}{DO}$ (ii)

From equation (i) & (ii) we get

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

$\therefore EF \parallel QR$

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Ans - $AB \parallel PQ$

$\therefore \frac{OA}{AP} = \frac{OB}{BQ}$ (i)

and $AC \parallel PR$

$\therefore \frac{OA}{AP} = \frac{OC}{CR}$

From equations (i) & (ii) we get

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

$\therefore BC \parallel QR$

Hence, proved

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

To prove : $AE = EC$

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

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

But $AD = DB$

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

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

Hence, DE bisects AC.

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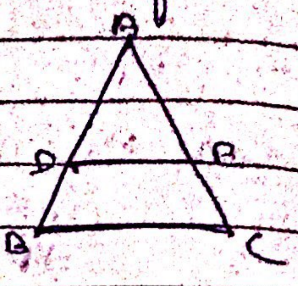
Q8 Ans - The given figure shows a ΔABC in which D & E are mid-points of sides AB & AC respectively.



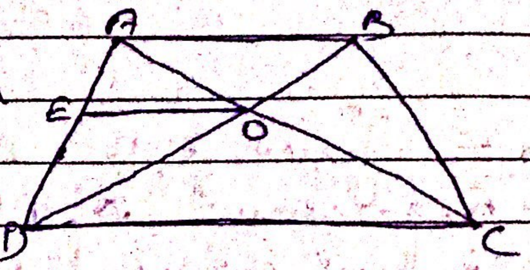
$\therefore \frac{AD}{DB} = 1$

& $\frac{AE}{AC} = 1$

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

Hence, proved.

Q9 Ans - Given ABCD is a trapezium in which $AB \parallel DC$



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

proof : In ΔABD

$EO \parallel DC$

$DC \parallel AB$

$\Rightarrow$ $EO \parallel AB$

$\therefore$ $\frac{AE}{ED} = \frac{BO}{DO}$ (i)

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

From equation (i) & (ii)

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

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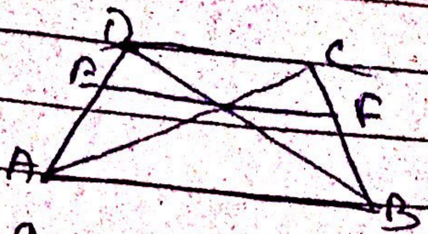
solns –



In the given figure is shown a quadrilateral ABCD. Draw EF || AB

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

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

In ΔDAB, $EO \parallel AB$

$$\therefore \frac{DE}{EA} = \frac{DO}{OB}$$

$$\Rightarrow \frac{AE}{ED} = \frac{BO}{OD} \quad \text{(ii)}$$

From equations (i) & (ii) we get

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

$\therefore OE \parallel CD$

But we have $AB \parallel OE$

$\therefore AB \parallel CD$

Hence, Quadrilateral ABCD is a trapezium proved.

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