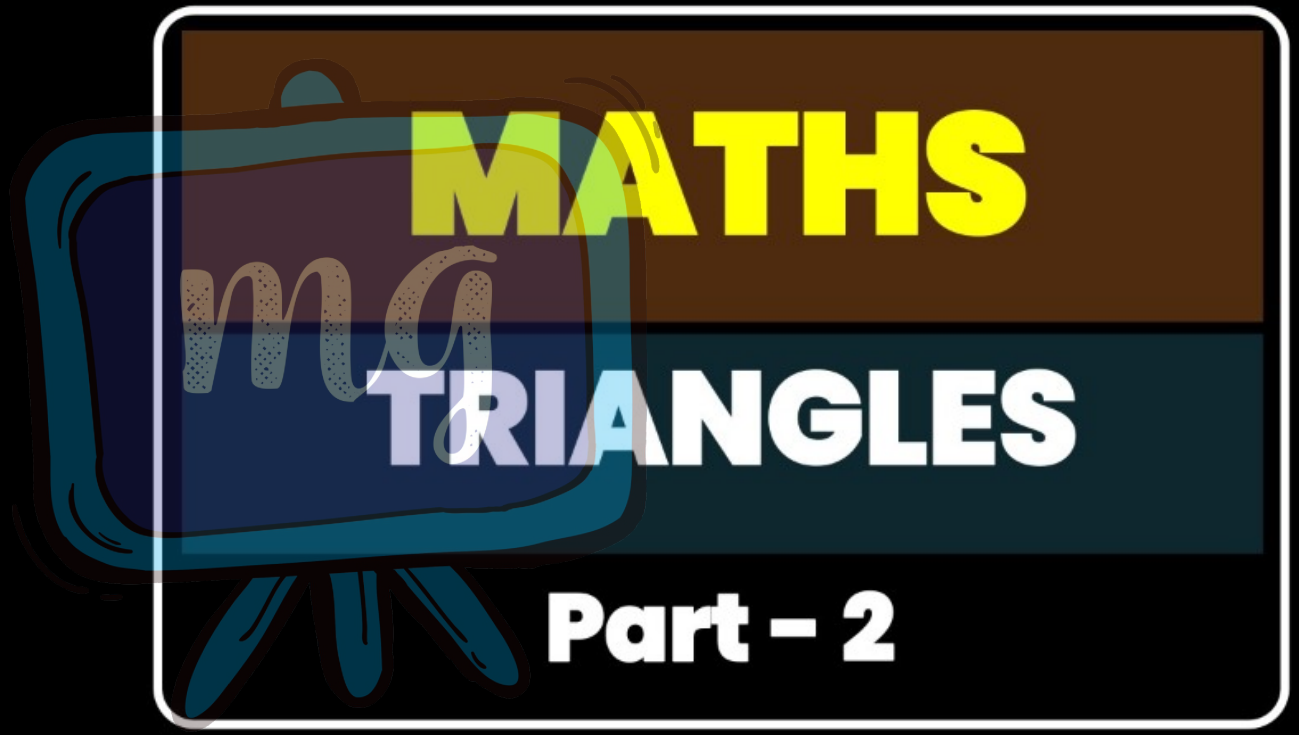
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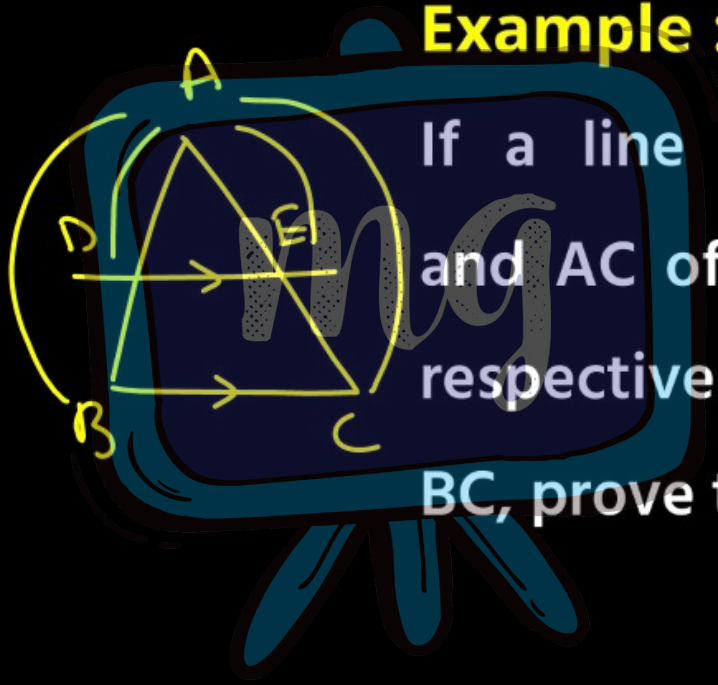


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MATHS

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Example : 1



If a line intersects sides AB and AC of a ΔABC at D and E respectively and is parallel to BC, prove that $\frac{AD}{AE} = \frac{AE}{AC}$

AB

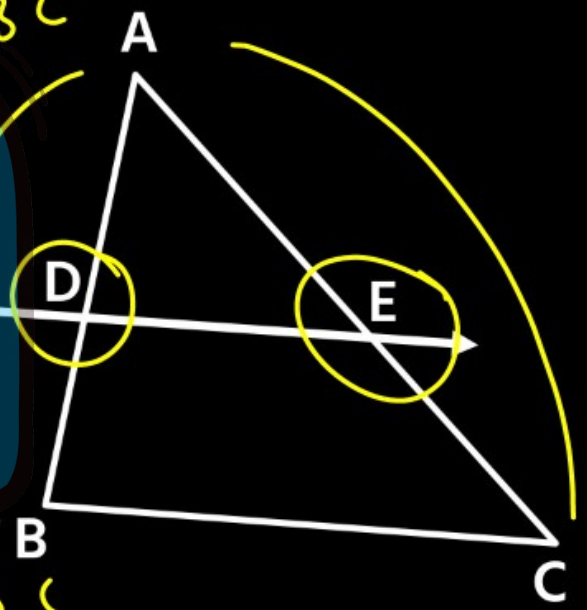
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Given:- $BE \parallel BC$

To Prove: $\frac{AD}{AB} = \frac{AE}{AC}$



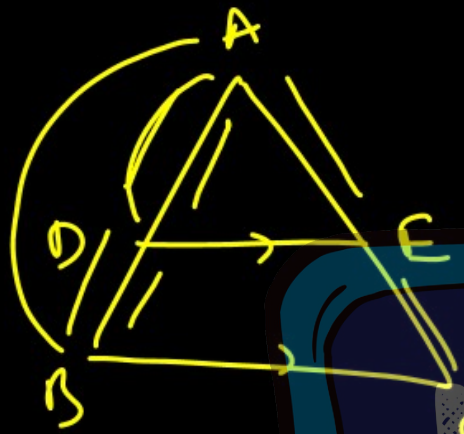
Proof:- $DE \parallel BC$

By Applying BPT

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

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$$\frac{AD}{DB} = \frac{AE}{EC} \quad \text{— (1)}$$

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

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

$$\frac{AB}{AD} = \frac{AC}{AE}$$

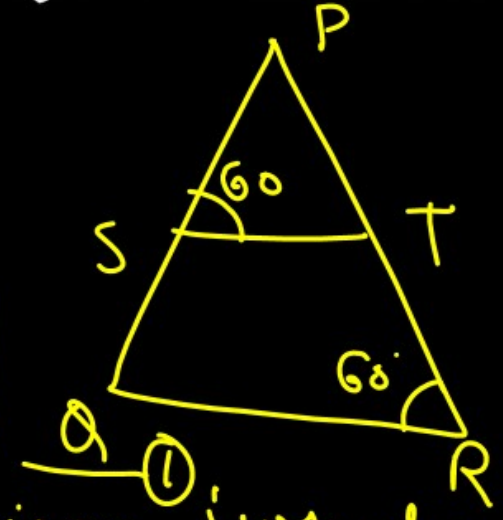
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Example : 3

In Fig., $\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle PST = \angle PRQ$. Prove that PQR is an isosceles triangle.



Given: $\frac{PS}{SQ} = \frac{PT}{TR}$

$\angle PST = \angle PRQ$

To Prove: ΔPQR is an isosceles.

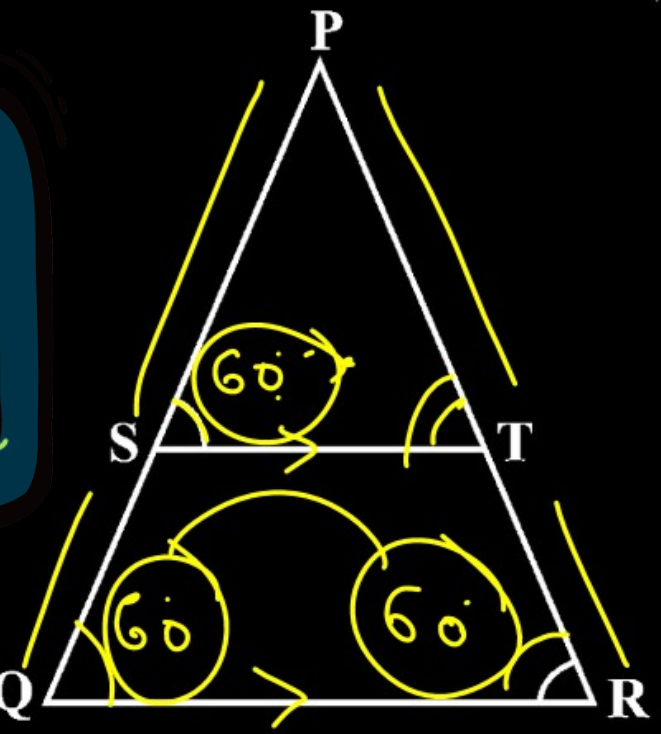
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$\frac{PS}{ST} = \frac{PT}{TR}$

$ST \parallel QR$

{By Converse of BPT}



$\angle PST = \angle PQR$

$\because$ — (Corresponding Angles)

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By (1) and (2)

$$\left\{\begin{array}{l} \angle PST = \angle PRQ \\ \angle PST = \angle PQR \end{array}\right\}$$

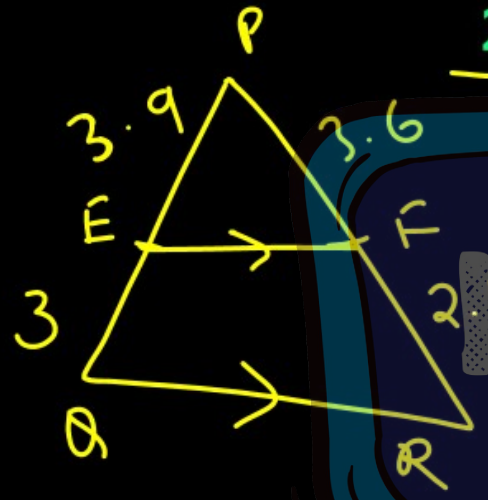
$$\angle PRQ = \angle PQR$$

Hence ΔPQR is an isosceles Triangle.

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Exercise : 6.2



2. E and F are points on the sides PQ and PR respectively of a Δ PQR. For each of the following cases, state whether EF II QR

(i) PE = 3.9 cm, EQ = 3 cm, PF = 3.6 cm and FR = 2.4 cm

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

$\frac{3.9}{3} = \frac{3.6}{2.4}$

$\frac{13}{10} = \frac{3}{2}$

EF is not parallel to QR

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Exercise : 6.2

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(ii) PE = 4 cm, QE = 4.5 cm,

PF = 8 cm and RF = 9 cm



By converse of BPT

EF || QR

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

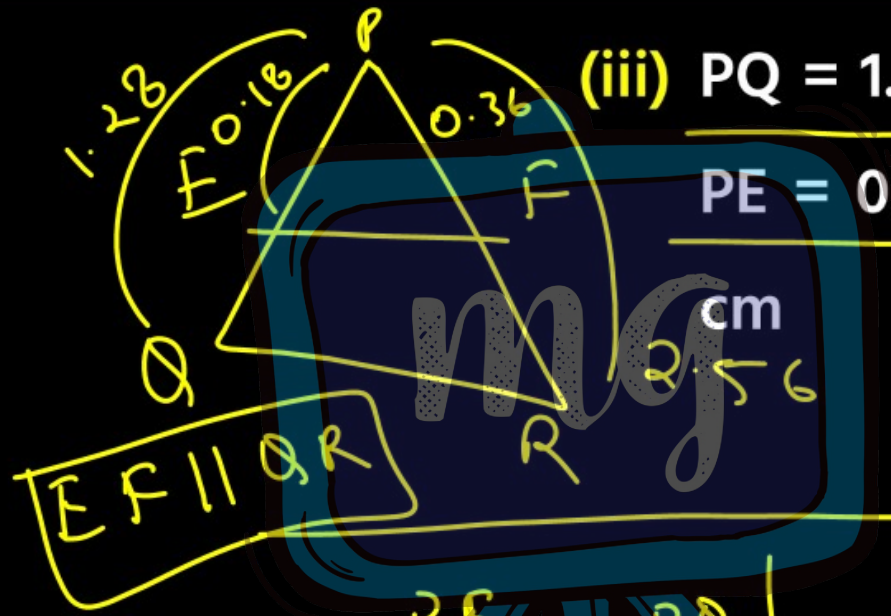
$2 \times \frac{4}{9} = \frac{8}{9}$

$\frac{8}{9} = \frac{8}{9}$ ✓

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Exercise : 6.2

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(iii) PQ = 1.28 cm, PR = 2.56 cm,

PE = 0.18 cm and PF = 0.36

$\frac{PE}{PF} = \frac{PQ}{PR}$

$\frac{PE}{PQ} = \frac{PF}{PR}$

$\frac{0.18}{1.28} = \frac{0.36}{2.56}$

$\frac{0.18}{0.36} = \frac{1.28}{2.56}$

$= \frac{1}{2}$

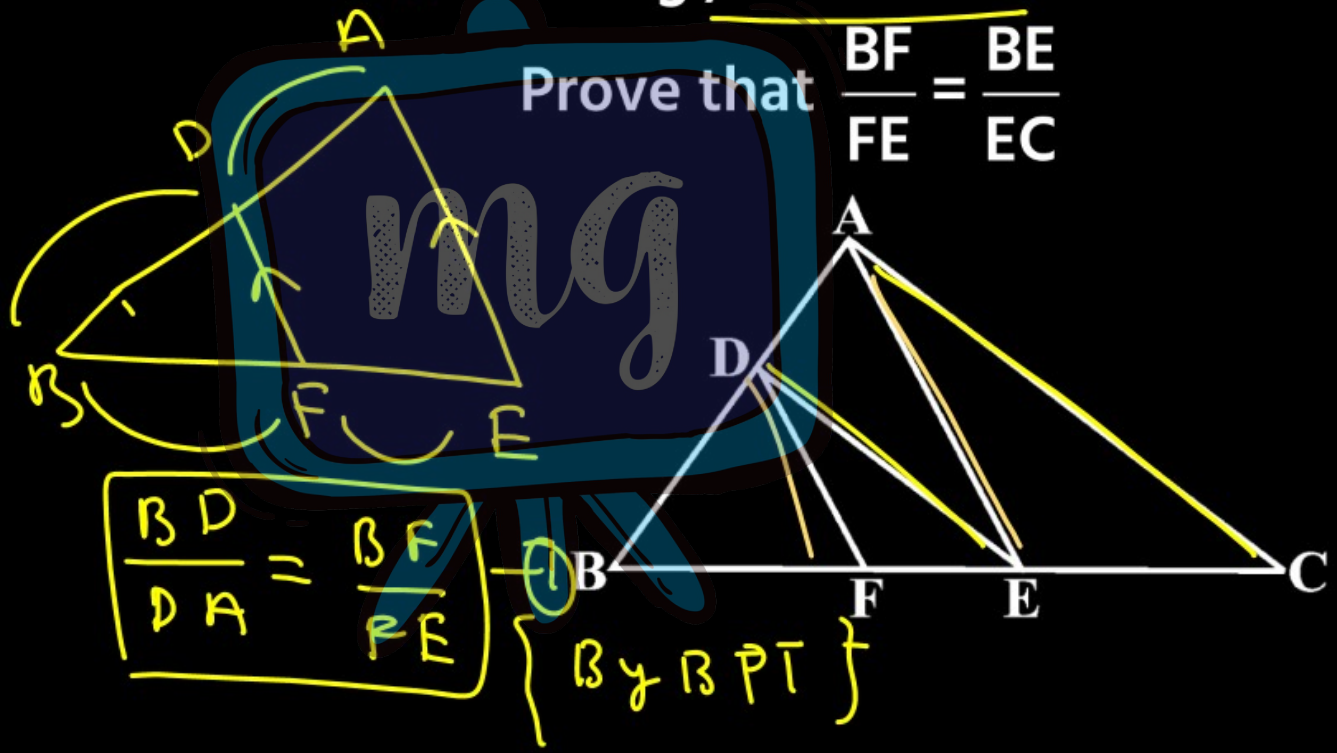
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Exercise : 6.2

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4. In Fig., DE II AC and DF II AE.

Prove that $\frac{BF}{FE} = \frac{BE}{EC}$

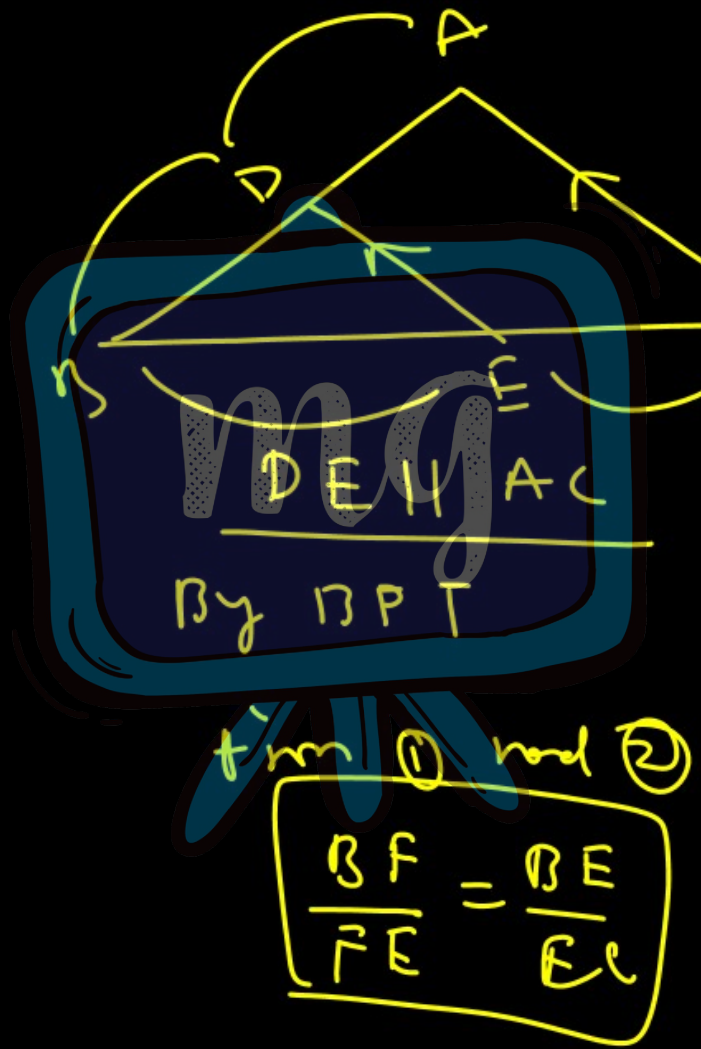


$\frac{BD}{DA} = \frac{BF}{FE}$ — (1)

{By BPT}

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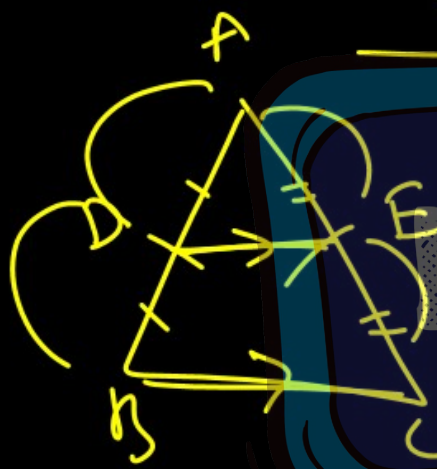


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Exercise : 6.2

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8. Using Theorem 6.2, prove that the line joining the mid-points of any two sides of a triangle is parallel to the third side. (Recall that you have done it in Class IX).



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

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

Hence

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

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From Comm. of BPT

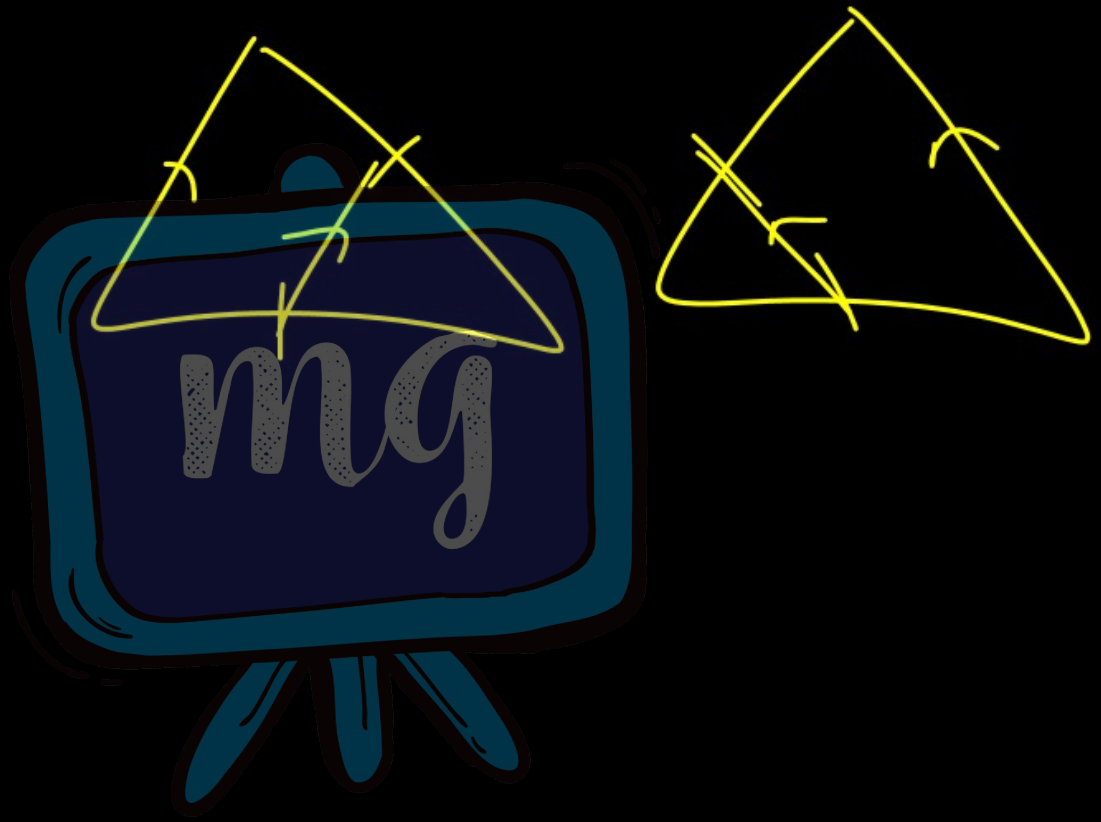
DE ∥ BC

H.P.



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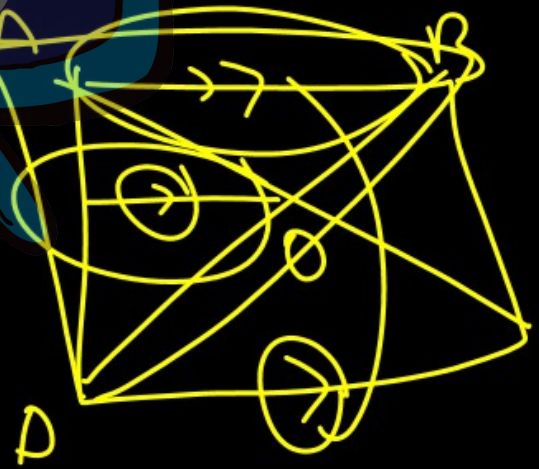
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Exercise : 6.2

10. The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO} = \frac{CO}{DO}$. Show that ABCD is a trapezium.

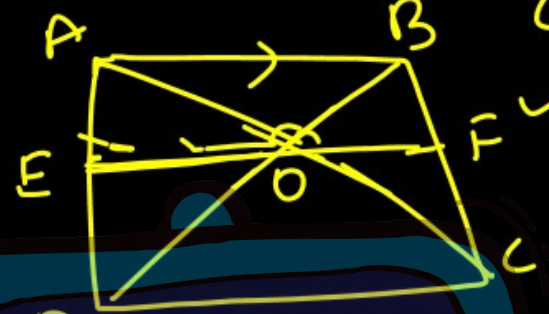
Solu.



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

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Given: $\frac{OA}{OB} = \frac{OC}{OD}$

To Prove: $\square ABCD$ is Trapezium.

Constr.: $EF \parallel AB$



As $EO \parallel AB$

By Applying BPT

$$\frac{AE}{DE} = \frac{OB}{OD}$$

$$\frac{DE}{EA} = \frac{DO}{OB} \quad \text{---(1)}$$

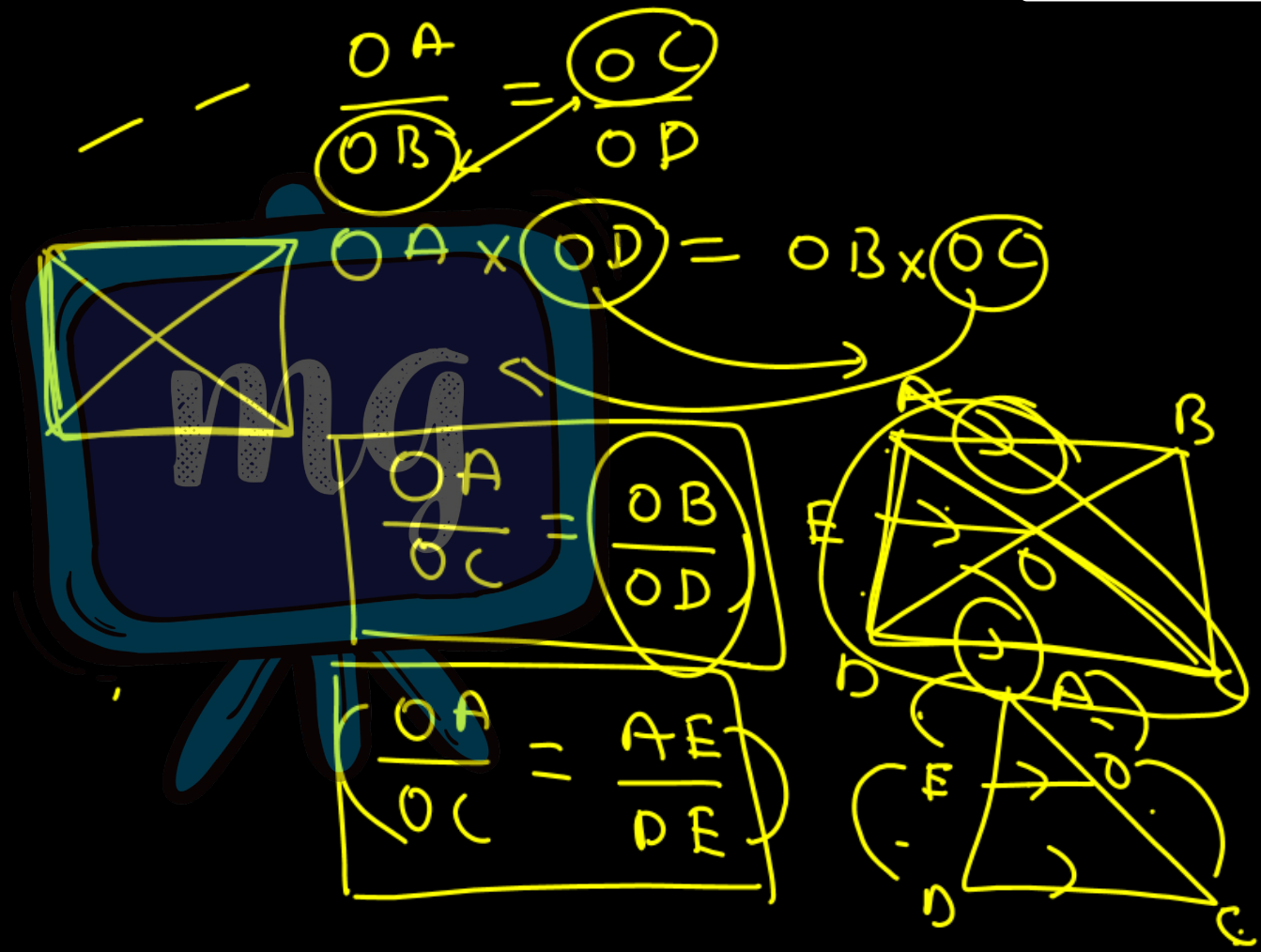
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Hence By the use of Converse of BPT.

If $\frac{AE}{DE} = \frac{OA}{OC}$

$EO \parallel DC$

$EO \parallel AB \parallel DC$

$AB \parallel CD$

