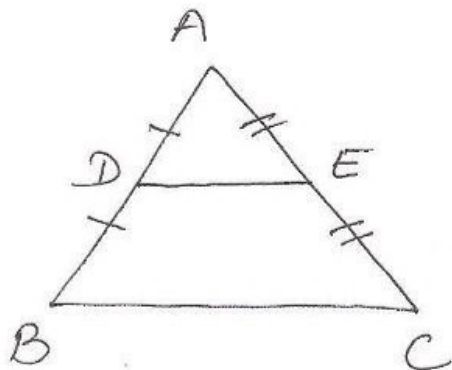


8



to prove $DE \parallel BC$

proof $AD = DB$

$$\Rightarrow \frac{AD}{DB} = 1 \dots \text{--- (i)}$$

$$AE = EC$$

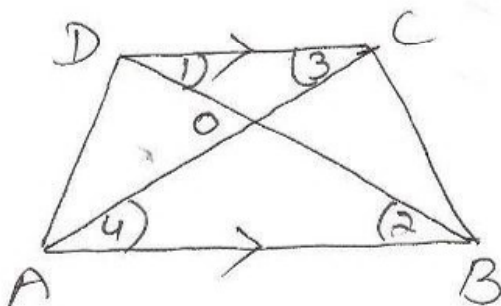
$$\Rightarrow \frac{AE}{EC} = 1 \dots \text{--- (ii)}$$

From (i), (ii)

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

by converse of basic prop. theorem
 $DE \parallel BC$

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

proof $AB \parallel DC$
 $\angle 1 = \angle 2$ (convex.)
 $\angle 3 = \angle 4$ (angles)

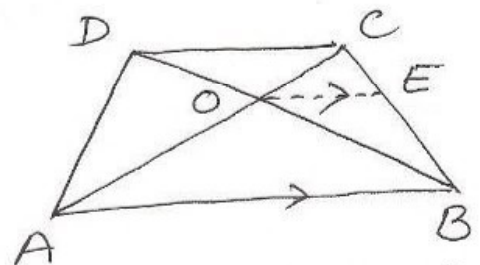
$\therefore \Delta COD \sim \Delta AOB$
by AA Similarity

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

using alternendo

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

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To show $\square ABCD$ is a trapezium

Const - draw $OE \parallel AB$

proof In ΔCAB
 $OE \parallel AB$

$$\frac{CO}{AO} = \frac{CE}{EB} \quad (\text{basic prop. th.})$$

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

appl. alternendo

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

$\therefore \frac{CE}{EB} = \frac{DO}{BO}$ by converse of basic prop th. $OE \parallel DC$
but $OE \parallel AB$ $\therefore AB \parallel DC$
 $\square ABCD$ is a trap.