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(Affiliated to CBSE up to +2 Level)

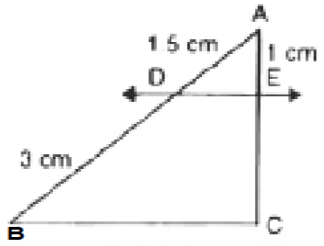
CLASS: X **SUB.: MATHS (NCERT BASED)** **DATE: 05-09-2020**

EXERCISE 6.2

1. In figure DE || BC. Find EC

Sol. (i) Since DE || BC

∴ Using the Basic proportionality Theorem,



We have: $\frac{AD}{DB}=\frac{AE}{EC}$

Since, AD = 1.5 cm, DB = 3 cm and AE = 1 cm,

$\therefore \frac{1.5\text{ cm}}{3\text{ cm}}=\frac{1\text{ cm}}{EC}$

By cross-multiplication, we have:

$EC \times 1.5 = 1 \times 3$

$\Rightarrow EC=\frac{1\times 3}{1.5}=\frac{1\times 3\times 10}{15}$

$\therefore$ EC = 2 cm.

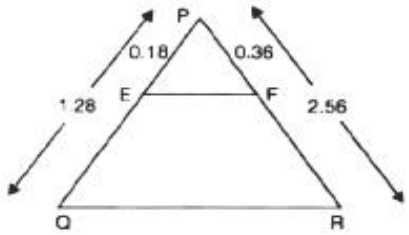
2. E and F are points on the sides PQ and PR respectively of a A PQR. For each of the following cases, state whether EF || QR:

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

(ii) PE = 4 cm, QE = 4.5 cm, PF = 8 cm and RF = 9 cm

(iii) PQ = 1.28 cm, PR = 2.56 cm, PE = 0.18 cm and PF = 0.36 cm

Sol (ii) We have PE = 0.18, PQ = 1.28
PF = 0.36 and PR = 2.56



$\therefore \frac{PE}{PQ}=\frac{0.18}{1.28}=\frac{18}{128}=\frac{9}{64}$

And $\frac{PE}{PR}=\frac{0.36}{2.56}=\frac{36}{256}=\frac{9}{64}$

$\because \frac{PE}{PQ}=\frac{PE}{PR} \Rightarrow$ EF is parallel to QR.

7. Using Thales' Theorem 6.1. prove that a line drawn through the mid-point of one side of a triangle parallel to another side bisects the third side. (Recall that yiu have proved it in Class IX).

Sol. We have a ΔABC in which D is the mid point of AB and E is a point on AC such that DE. ||BC [Given]

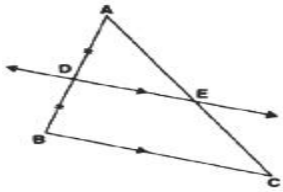
∴ Using the Basic Proportionality Theorem, we get

$\frac{AD}{DB}=\frac{AE}{EC}$ ...(1)

But D is the mid point of AB

∴ AD = DB

$\Rightarrow \frac{AD}{DB}=1$ ...(2)



From (1) and (2), we have:

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

$\Rightarrow$ E is the mid point of AC.

9. ABCD is a trapezium in which AB || DC and its diagonals irsect each other at the point O.
Show $\frac{AO}{BO}=\frac{CO}{DO}$.

Given: We have, a trapezium ABCD such that AB || DC. The diagonal as AC and BD intersect each other at O.

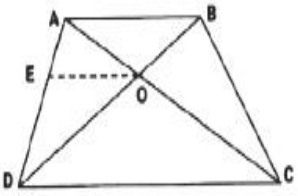
To prove: $\frac{AO}{BO}=\frac{CO}{DO}$.
Const. : draw OE parallel to AB or DC.
Proof: In ΔADC,
∵OE || DC [By construction]
∴ Using the Basic -Proportionality theorem, we get

$$\frac{AE}{ED}=\frac{AO}{CO} \quad ...(1)$$

In ΔABD,
∵ OE || AB [By construction]
∴ Using the Basic Proportionality Theorem, we get

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

$$\Rightarrow \frac{AE}{ED}=\frac{BO}{DO} \quad ...(2)$$



From (1) and (2),

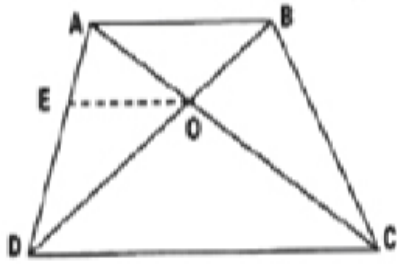
$$\frac{AE}{ED}=\frac{BO}{DO}=\frac{AO}{CO}$$

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

10. The diagonals of a quadrilateral ABCD intersect each other at the point 0 such that $\frac{AO}{BO}=\frac{CO}{DO}$. Show that ABCD is a trapezium.

Given: Quad. ABCD in which diagonals AC and BD
intersect each other at O such that

$$\frac{AO}{BO}=\frac{CO}{DO} \text{ or } \frac{AO}{OC}=\frac{BO}{OD}$$



To Prove: ABCD is a trapezium
Const: draw OE parallel to DC.
Proof: In ⊿ADC OE ‖ DC

$\frac{AE}{ED}=\frac{AO}{OD}$ ∴ Using the BPT, we get _____ (i)

$\frac{AO}{OC}=\frac{BO}{OD}$ (given)_____(ii)

From Eqn. (i) and (ii) we get

$\frac{AE}{ED}=\frac{BO}{OD}$
∴ Using the converse of the BPT, we have
OE || DC and OE ||AB
⇒ AB || DC
⇒ ABCD is a trapezium.