

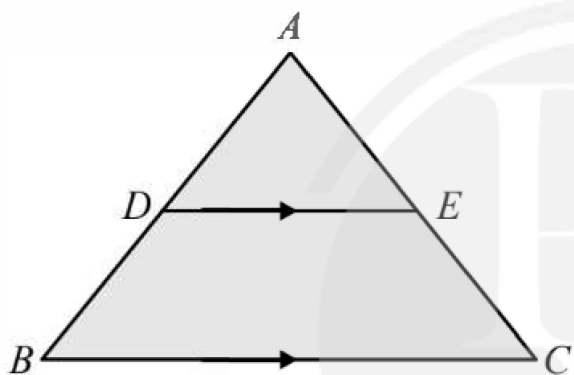
UDAAN 2025

Mathematics

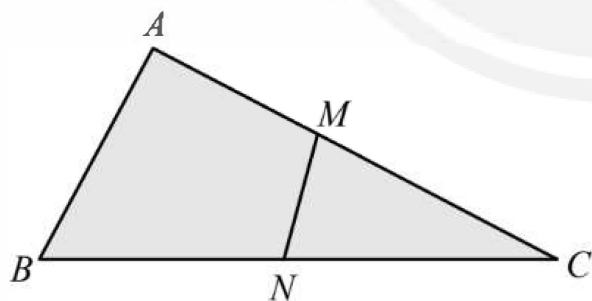
Triangles

DHA : 01

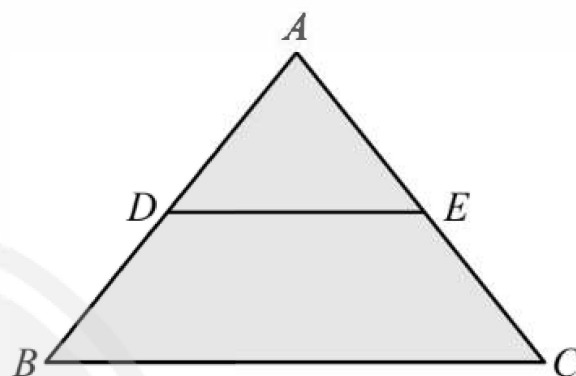
- Q1** In the given figure, in $\triangle ABC$, $DE \parallel BC$ so that $AD = (4x - 3)\text{cm}$, $AE = (8x - 7)\text{cm}$, $BD = (3x - 1)\text{cm}$, $CE = (5x - 3)\text{cm}$. Find the value of x .



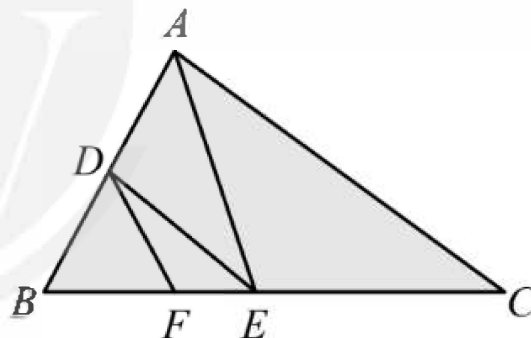
- Q2** In the given figure, $MN \parallel AB$, $BC = 7.5\text{ cm}$, $AM = 4\text{ cm}$ and $MC = 2\text{ cm}$. Find the length of BN .



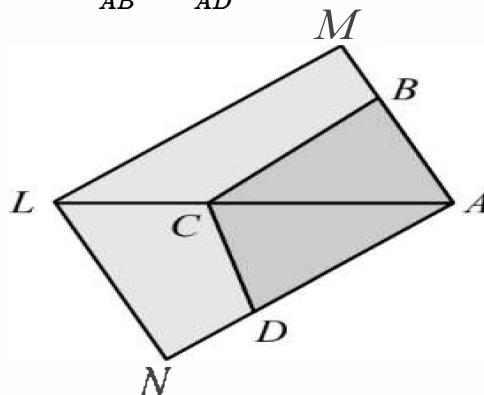
- Q3** In the given figure, $DE \parallel BC$ and $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 4.8\text{ cm}$, find the length of AE .



- Q4** In the given figure, $DE \parallel AC$ and $DF \parallel AE$. Prove that $\frac{BF}{FE} = \frac{BE}{EC}$.



- Q5** In the given figure, $LM \parallel CB$ and $LN \parallel CD$. Prove that $\frac{AM}{AB} = \frac{AN}{AD}$.



Answer Key

Q1 1

Q2 5 cm

Q3 $AE=1.8\text{cm}$

Q4 (Use BPT)

Q5 (Use BPT)



Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

$$\begin{aligned}\frac{AD}{DB} &= \frac{AE}{EC} \\ \Rightarrow \frac{4x-3}{3x-1} &= \frac{8x-7}{5x-3} \\ \Rightarrow (4x-3)(5x-3) &= (8x-7)(3x-1) \\ \Rightarrow 4x(5x-3) - 3(5x-3) &= 8x(3x-1) - 7(3x-1) \\ \Rightarrow 20x^2 - 12x - 15x + 9 &= 24x^2 - 8x - 21x + 7 \\ \Rightarrow 4x^2 - 2x - 2 &= 0 \\ \Rightarrow 2(2x^2 - x - 1) &= 0 \\ \Rightarrow 2x^2 - x - 1 &= 0 \\ \Rightarrow 2x^2 - 2x + 1x - 1 &= 0 \\ \Rightarrow 2x(x-1) + 1(x-1) &= 0 \\ \Rightarrow (2x+1)(x-1) &= 0 \\ \Rightarrow 2x+1=0 \text{ or } x-1 &= 0 \\ \Rightarrow x = -1/2 \text{ or } x &= 1 \\ x = -1/2 \text{ is not possible} \\ \therefore x &= 1\end{aligned}$$

Video Solution:



Q2 Text Solution:

As MNIIBC
By using BPT
 $CM/CA = CN/CB$
 $2/6 = CN/7.5$
 $CN = 7.5 \times 2/6$
 $CN = 2.5 \text{ cm}$
 $BN = BC - CN$
 $= 7.5 - 2.5$
 $= 5 \text{ cm}$

Video Solution:



Q3 Text Solution:

In $\triangle ABC$,
 $DE \parallel BC$ (Given)
Since point D divides AB in the ratio 3 : 5.
So, $AD : DB = 3 : 5$
By basic proportionality theorem,
 $AD/DB = AE/EC$
 $3/5 = AE/EC$
 $EC/AE = 5/3$
on adding 1 to both the sides
 $EC/AE + 1 = 5/3 + 1$
 $AC/AE = 8/3$
 $4.8/AE = 8/3$
 $AE = 4.8 \times 3/8$
 $\Rightarrow AE = 1.8 \text{ cm}$

Video Solution:



Q4 Text Solution:

Use BPT
In $\triangle ABC$, $DE \parallel AC$ (Given)
 $\therefore BD/DA = BE/EC \dots (i)$ [By using Basic



Proportionality Theorem]

In $\triangle ABE$, $DF \parallel AE$ (Given)

$\therefore BD/DA = BF/FE \dots (ii)$ [By using Basic Proportionality Theorem]

From equation (i) and (ii), we get,

$$BF/FE = BE/EC$$

Video Solution:



Q5 Text Solution:

In $\triangle ALM$

$LM \parallel CB$

$$AB/BM = AC/CL \dots (1)$$

In $\triangle ALN$

$LN \parallel CD$

$$AD/DN = AC/CL \dots (2)$$

From equations (1) and (2)

$$AB/BM = AD/DN$$

$$\Rightarrow BM/AB = DN/AD$$

Adding 1 on both sides

$$BM/AB + 1 = DN/AD + 1$$

$$(BM + AB)/AB = (DN + AD)/AD$$

$$AM/AB = AN/AD$$

$$\Rightarrow AM/AB = AN/AD$$

Hence proved.

Video Solution:



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