Exercise 4A

Question 1:
(i) In **ΔABC**, DE ∥ BC, AD = 3.6 cm, AB = 10 cm, AE = 4.5 cm

$$\therefore \frac{AD}{DB} = \frac{AE}{EC} \qquad \text{(By Thales theorem)}$$

$$\Rightarrow \frac{3.6}{AB - AD} = \frac{4.5}{AC - AE}$$

$$\Rightarrow \frac{3.6}{10 - 3.6} = \frac{4.5}{AC - 4.5}$$

$$\Rightarrow \frac{3.6}{6.4} = \frac{4.5}{AC - 4.5}$$

$$\Rightarrow 3.6\,AC - 16.2 = 28.8$$

$$\Rightarrow 3.6AC = 45$$

$$\Rightarrow AC = 12.5\,cm$$

$$\therefore EC = AC - AE = 12.5 - 4.5 = 8\,cm$$

Hence, AC = 12.5 cm and EC = 8cm

(ii) In **ΔABC**, DE ∥ BC, AB = 13.3 cm, AC = 11.9 cm and EC = 5.1 cm

$$\therefore \frac{AD}{DB} = \frac{AE}{EC} \qquad \text{(By Thales theorem)}$$

$$\Rightarrow \frac{AD}{AB - AD} = \frac{AC - EC}{EC}$$

$$\Rightarrow \frac{AD}{13.5 - AD} = \frac{11.9 - 5.1}{5.1}$$

$$\Rightarrow \frac{AD}{13.5 - AD} = \frac{6.8}{5.1}$$

$$\Rightarrow 5.1\,AD = 91.8 - 6.8\,AD$$

$$\Rightarrow 11.9\,AD = 91.8$$

$$\Rightarrow AD = \frac{91.8}{11.9} = 7.7$$

Hence, AD = 7.7 cm

(iii) In ΔABC, DE || BC, AC = 6.6 cm, $\dfrac{AD}{DB} = \dfrac{4}{7}$

∴ $\dfrac{AD}{DB} = \dfrac{AE}{EC}$ (by thales theorem)

∴ $\dfrac{4}{7} = \dfrac{AE}{AC - AE}$

⇒ $\dfrac{4}{7} = \dfrac{AE}{6.6 - AE}$

⇒ 26.4 − 4 AE = 7 AE

⇒ 26.4 = 11 AE

⇒ AE = $\dfrac{26.4}{11}$ = 2.4 cm

Hence, AE = 2.4 cm

(iv) In ΔABC, DE || BC, Given $\dfrac{AD}{AB} = \dfrac{8}{15}$, EC=3.5cm

∴ $\dfrac{AD}{DB} = \dfrac{AE}{EC}$ (by thales theorem)

and AD = $\dfrac{8}{15}$ AB   [Given]

∴ $\dfrac{AD}{AB - AD} = \dfrac{AE}{3.5}$ $\left[\because AD = \dfrac{8}{15} AB \right]$

$\dfrac{\frac{8}{15} AB}{AB - \frac{8}{15} AB} = \dfrac{AE}{3.5}$

⇒ $\dfrac{\frac{8}{15} AB}{\frac{7}{15} AB} = \dfrac{AE}{3.5}$

⇒ $\dfrac{8}{7} = \dfrac{AE}{3.5}$

⇒ AE = $\dfrac{3.5 \times 8}{7}$

⇒ AE = 4cm

Hence AE = 4 cm

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