Exercise 4A

Question 1:

(i) In ΔABC, DE || BC, AD = 3.6 cm, AB = 10 cm, AE = 4.5 cm

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

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

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

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

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

$$\Rightarrow 3.6AC = 45$$

$$\Rightarrow AC = 12.5\ cm$$

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

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 $\Delta ABC$, DE || BC, AC = 6.6 cm, $\frac{AD}{DB} = \frac{4}{7}$

$\therefore \frac{AD}{DB} = \frac{AE}{EC}$ (by thales theorem)

$\therefore \frac{4}{7} = \frac{AE}{AC - AE}$

$\Rightarrow \frac{4}{7} = \frac{AE}{6.6 - AE}$

$\Rightarrow 26.4 - 4\,AE = 7\,AE$

$\Rightarrow 26.4 = 11\,AE$

$\Rightarrow AE = \frac{26.4}{11} = 2.4$ cm

Hence, AE = 2.4 cm

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

$\therefore \frac{AD}{DB} = \frac{AE}{EC}$ (by thales theorem)

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

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

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

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

$\Rightarrow \frac{8}{7} = \frac{AE}{3.5}$

$\Rightarrow AE = \frac{3.5 \times 8}{7}$

$\Rightarrow AE = 4$cm

Hence AE = 4 cm

********** END **********