Exercise 4A

Question 2:
(i) D and E are points on the sides AB and AC respectively of a ΔABC such that DE || BC, AD = x cm, DB = (x - 2) cmm, AE = (x + 2) cm, EC = (x - 1) cm

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

$$\Rightarrow \frac{x}{x-2} = \frac{x+2}{x-1}$$

$$\Rightarrow x(x-1) = x^2 - 4 \Rightarrow x^2 - x = x^2 - 4$$

$$\Rightarrow \qquad x = 4$$

(ii) In ΔABC, DE || BC, AD = 4 cm, DB = (x - 4) cm, AE = 8 cm, EC = (3x - 19) cm

$$\frac{AD}{AB} = \frac{AE}{EC} \text{ (By thales theorem)}$$

$$\Rightarrow \quad \frac{4}{x-4} = \frac{8}{3x-19} \Rightarrow 4(3x-19) = 8(x-4)$$

$$\Rightarrow \quad 12x - 76 = 8x - 32$$

$$\Rightarrow \quad 4x = 44$$

$$\Rightarrow \quad x = 11$$

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

$$\frac{7x-4}{3x+4} = \frac{5x-2}{3x}$$

Hence, x = 11

(iii) In ΔABC, DE || BC, AD = (7x - 4) cm, AE = (5x - 2) cm, DB = (3x + 4)cm, EC = 3x cm

$$\Rightarrow 21x^2 - 12x = 15x^2 - 6x + 20x - 8$$

$$\Rightarrow 6x^2 - 26x + 8 = 0$$

$$3x^2 - 13x + 4 = 0$$

$$3x^2 - 12x - x + 4 = 0$$

$$3x(x-4) - 1(x-4) = 0$$

$$(x-4)(3x-1) = 0$$

$$x = 4 \text{ or } x = \frac{1}{3}$$

If $x = \frac{1}{3}$, lengths of sides become negative

Hence, $x = 4$

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