



Linear Inequations Ex 15.3 Q1

Consider the first inequation,

$$x + \frac{1}{3} \geq 0$$

$$\therefore \text{e. } x \geq \frac{-1}{3}.$$

$$\left| x + \frac{1}{3} - \frac{8}{3} > 0 \right|$$

$$x + \frac{1}{3} - \frac{8}{3} > 0$$

$$\frac{3x - 7}{3} > 0$$

$$3x - 7 > 0$$

$$x > \frac{7}{3} \quad \dots (i)$$

Consider the second inequation,

$$x + \frac{1}{3} < 0 \quad \therefore \text{e. } x < -\frac{1}{3}$$

$$\left| x + \frac{1}{3} - \frac{8}{3} > 0 \right|$$

$$-x - \frac{1}{3} - \frac{8}{3} > 0$$

$$-3x - 9 > 0$$

$$-3x > 9$$

$$3x < -9$$

$$x < \frac{-9}{3}$$

$$x < -3 \quad \dots (ii)$$

From (i) and (ii), $(-\infty, -3) \cup \left(\frac{7}{3}, \infty\right)$ is the solution set of the simultaneous equations.

Linear Inequations Ex 15.3 Q2

We have,

$$|4 - x| + 1 - 3 < 0$$

$$\Rightarrow |4 - x| - 2 < 0 \quad \dots (i)$$

Case I: When $|4 - x| \geq 0$

$$|4 - x| - 2 < 0$$

$$\Rightarrow 4 - x - 2 < 0$$

$$\Rightarrow 2 - x < 0$$

$$\Rightarrow -x < -2$$

$$\Rightarrow x > 2 \quad \dots (ii)$$

Case II: When $|4 - x| < 0$

$$|4 - x| - 2 < 0$$

$$\Rightarrow -(4 - x) - 2 < 0$$

$$\Rightarrow -4 + x - 2 < 0$$

$$\Rightarrow x - 6 < 0$$

$$\Rightarrow x < 6 \quad \dots (iii)$$

Combining (ii) and (iii) we get $(2, 6)$ as the solution set.

Linear Inequations Ex 15.3 Q3

We have,

$$\frac{|3x - 4|}{2} - \frac{5}{12} \leq 0$$

Case I: When $|3x - 4| \geq 0$

$$\frac{|3x - 4|}{2} - \frac{5}{12} \leq 0$$

$$\Rightarrow \frac{|3x - 4|}{2} - \frac{5}{12} \leq 0$$

$$\Rightarrow \frac{3x - 4}{2} - \frac{5}{12} \leq 0$$

$$\Rightarrow \frac{6(3x - 4) - 5}{12} \leq 0$$

$$\Rightarrow 18x - 24 - 5 \leq 0$$

$$\Rightarrow 18x - 29 \leq 0$$

$$\Rightarrow 18x \leq 29$$

$$\Rightarrow x \leq \frac{29}{18} \quad \dots (ii)$$

Case II: When $|3x - 4| < 0$

$$\frac{|3x - 4|}{2} - \frac{5}{12} \leq 0$$

***** END *****