



Linear Inequations Ex 15.1 Q25

$$\frac{5x + 8}{4 - x} < 2$$

$$\frac{5x + 8}{4 - x} - 2 < 0$$

$$\frac{5x + 8 - 2(4 - x)}{4 - x} < 0$$

$$\frac{5x + 8 - 8 + 2x}{4 - x} < 0$$

$$\frac{7x}{4 - x} < 0$$

$$\begin{array}{ll} \text{Case 1: } 7x > 0 & \text{and } 4 - x < 0 \\ \Rightarrow x > 0 & \text{and } 4 < x \end{array}$$

$$\Rightarrow 4 < x$$

$$\begin{array}{ll} \text{Case 2: } 7x < 0 & \text{and } 4 - x > 0 \\ \Rightarrow x < 0 & \text{and } 4 > x \\ \Rightarrow x < 0 \end{array}$$

Hence solution set is $(-\infty, 0) \cup (4, \infty)$

Linear Inequations Ex 15.1 Q26

$$\frac{x-1}{x+3} > 2$$

$$\frac{x-1}{x+3} - 2 > 0$$

$$\frac{x-1-2(x+3)}{x+3} > 0$$

$$\frac{x-1-2x-6}{x+3} > 0$$

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

$$\frac{x+7}{x+3} < 0$$

$$\begin{array}{ll} \text{Case 1: } x+7 > 0 & \text{and } x+3 < 0 \\ \Rightarrow x > -7 & \text{and } x < -3 \end{array}$$

$$\begin{array}{ll} \text{Case 2: } x+7 < 0 & \text{and } x+3 > 0 \\ \Rightarrow x < -7 & \text{and } x > -3 \end{array}$$

This is not possible.

\therefore The solution set is $(-7, -3)$

$$\frac{7x-5}{8x+3} > 4$$

$$\frac{7x-5}{8x+3} - 4 > 0$$

$$\frac{7x-5-4(8x+3)}{8x+3} > 0$$

$$\frac{7x-5-32x-12}{8x+3} > 0$$

$$\frac{-25x-17}{8x+3} > 0$$

$$\frac{25x+17}{8x+3} < 0$$

Case 1: $25x+17 > 0$ and $8x+3 < 0$

$$\Rightarrow x > \frac{-17}{25} \quad \text{and} \quad x < \frac{-3}{8}$$

Case 2: $25x+17 < 0$ and $8x+3 > 0$

$$\Rightarrow x < \frac{-17}{25} \quad \text{and} \quad x > \frac{-3}{8}$$

This is not possible

\therefore Hence the solution set is $\left(\frac{-17}{25}, \frac{-3}{8}\right)$

$$\frac{x}{x-5} > \frac{1}{2}$$

$$\frac{x}{x-5} - \frac{1}{2} > 0$$

$$\frac{2x - (x-5)}{2(x-5)} > 0$$

$$\frac{2x - x + 5}{2x - 10} > 0$$

$$\frac{x + 5}{2x - 10} > 0$$

$$\text{Case 1: } x + 5 > 0 \quad \text{and} \quad 2x - 10 > 0$$

$$\Rightarrow x > -5 \quad \text{and} \quad x > 5$$

$$\Rightarrow x > 5$$

$$\text{Case 2: } x + 5 < 0 \quad \text{and} \quad 2x - 10 < 0$$

$$\Rightarrow x < -5 \quad \text{and} \quad x < 5$$

$$\Rightarrow x < -5$$

Hence the solution set is $(-\infty, -5) \cup (5, \infty)$

***** END *****