

3. solve for x , $\frac{|x+3|+x}{x+2} > 1$

Solⁿ

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

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

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

CASE: 1 $x+3 \geq 0 \Rightarrow x \geq -3 \Rightarrow x \in [-3, \infty)$

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

$$\Rightarrow \frac{x+1}{x+2} > 0$$

$$\Rightarrow (x+1 > 0 \text{ and } x+2 > 0) \text{ or } (x+1 < 0 \text{ and } x+2 < 0)$$

$$\Rightarrow (x > -1 \text{ and } x > -2) \text{ or } (x < -1 \text{ and } x < -2)$$

$$\Rightarrow x > -1 \text{ or } x < -2$$

$$\Rightarrow x \in (-1, \infty) \text{ or } x \in (-\infty, -2)$$

finally $\Rightarrow x \in (-3, -2) \cup (-1, \infty)$ --- ①
 $\{ \text{since } x \geq -3 \}$

CASE: 2 \Rightarrow

$$x+3 < 0 \Rightarrow x < -3 \Rightarrow x \in (-\infty, -3)$$

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

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

$$\Rightarrow \frac{x+5}{x+2} < 0 =$$

$$\Rightarrow (x+5 > 0 \text{ and } x+2 < 0) \text{ or } (x+5 < 0 \text{ and } x+2 > 0)$$

$$\Rightarrow (x < -2 \text{ and } x > -5) \text{ or } (x < -5 \text{ and } x > -2)$$

$$\Rightarrow x \in (-5, -2) \text{ --- ②}$$

NOT possible

by ① & ②

$$x \in (-5, -2) \cup (-1, \infty)$$