

Notes

Compound Inequalities

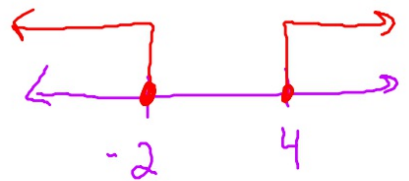
(A) Write the inequality



$$x < -5 \text{ OR } x \geq 3$$

$$(-\infty, -5) \cup [3, \infty)$$

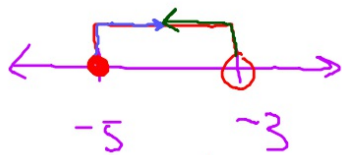
(B)



$$x \leq -2 \text{ OR } x \geq 4$$

$$(-\infty, -2] \cup [4, \infty)$$

(C)

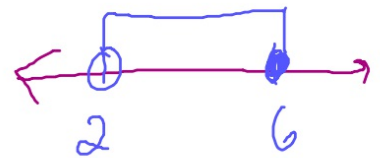


$$x \geq -5 \text{ and } x < -3$$

$$-5 \leq x < -3$$

$$[-5, -3)$$

(D)



$$x > 2 \text{ and } x \leq 6$$

$$2 < x \leq 6$$

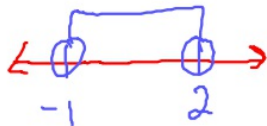
$$(2, 6]$$

Notes

Solving Compound Inequalities

(A) $3x + 2 > -1$ and $2x + 3 < 7$


$$\begin{array}{r} 3x + 2 > -1 \\ -2 \quad -2 \\ \hline 3x > -3 \\ \frac{3x}{3} > \frac{-3}{3} \\ x > -1 \end{array}$$

$x > -1$ 

$$\begin{array}{r} 2x + 3 < 7 \\ -3 \quad -3 \\ \hline 2x < 4 \\ \frac{2x}{2} < \frac{4}{2} \\ x < 2 \end{array}$$

$x < 2$

$x > -1$ or $x > -2$




(B) $3x + 2 > -1$ and $-2x + 3 < 7$

$x > -1$

$$\begin{array}{r} -2x + 3 < 7 \\ -3 \quad -3 \\ \hline -2x < 4 \\ \frac{-2x}{-2} < \frac{4}{-2} \\ x > -2 \end{array}$$

$x > -2$



(C) $5x - 7 < 13$ OR $4x + 3 \geq 23$

$$\begin{array}{r} 5x - 7 < 13 \\ +7 \quad +7 \\ \hline 5x < 20 \\ \frac{5x}{5} < \frac{20}{5} \\ x < 4 \end{array}$$

$x < 4$

$$\begin{array}{r} 4x + 3 \geq 23 \\ -3 \quad -3 \\ \hline 4x \geq 20 \\ \frac{4x}{4} \geq \frac{20}{4} \\ x \geq 5 \end{array}$$

$x \geq 5$

