

## Inequalities with Variables on Both Sides Video Guide

Solve each inequality.

$$\begin{array}{r|l}
 1) \quad b + 2 < 14 - 5b & \\
 +5b & +5b \\
 \hline
 6b + 2 < 14 & \\
 -2 & -2 \\
 \hline
 6b < 12 & \\
 \frac{6b}{6} & \frac{12}{6} \\
 \hline
 b < 2 & 
 \end{array}$$

$$\begin{array}{r|l}
 2) \quad 5x + 1 > 3x + 11 & \\
 -3x & -3x \\
 \hline
 2x + 1 > 11 & \\
 -1 & -1 \\
 \hline
 2x > 10 & \\
 \frac{2x}{2} & \frac{10}{2} \\
 \hline
 x > 5 & 
 \end{array}$$

$$\begin{array}{r|l}
 3) \quad -19 - n < -4 + 4n & \\
 -4n & -4n \\
 \hline
 -19 - 5n < -4 & \\
 +19 & +19 \\
 \hline
 -5n < 15 & \\
 \frac{-5n}{-5} & \frac{15}{-5} \\
 \hline
 n > -3 & 
 \end{array}$$

$$\begin{array}{r|l}
 4) \quad 13 + 3b \geq 6 + 10b & \\
 -10b & -10b \\
 \hline
 13 - 7b \geq 6 & \\
 -13 & -13 \\
 \hline
 -7b \geq -7 & \\
 \frac{-7b}{-7} & \frac{-7}{-7} \\
 \hline
 b \leq 1 & 
 \end{array}$$

$$\begin{array}{r|l}
 5) \quad 3p + 5 < 2p + 12 & \\
 -2p & -2p \\
 \hline
 p + 5 < 12 & \\
 -5 & -5 \\
 \hline
 p < 7 & 
 \end{array}$$

$$\begin{array}{r|l}
 6) \quad p - 9 < 5p - 17 & \\
 -5p & -5p \\
 \hline
 -4p - 9 < -17 & \\
 +9 & +9 \\
 \hline
 -4p < -8 & \\
 \frac{-4p}{-4} & \frac{-8}{-4} \\
 \hline
 p > 2 & 
 \end{array}$$

$$\begin{array}{r}
 7) \quad -7x + 13 \geq 7 - 6x \\
 \quad +6x \quad \quad +6x \\
 \hline
 -1x + 13 \geq 7 \\
 \quad -13 \quad -13 \\
 \hline
 -1x \geq -6 \\
 \quad \frac{-1}{-1} \quad \frac{-1}{-1} \\
 \hline
 \boxed{x \geq 6}
 \end{array}$$

$$\begin{array}{r}
 8) \quad -10 + 5n \geq n + 2 \\
 \quad \quad -1n \quad -1n \\
 \hline
 -10 + 4n \geq 2 \\
 \quad +10 \quad \quad +10 \\
 \hline
 4n \geq 12 \\
 \quad \frac{4}{4} \quad \frac{12}{4} \\
 \hline
 \boxed{n \geq 3}
 \end{array}$$

$$9) \quad 2 + r \geq 4r - 10$$

- A)  $r \geq -10$       B)  $r \leq -10$   
 C)  $r \leq 4$         D)  $r \geq 4$

$$\begin{array}{r}
 2 + r \geq 4r - 10 \\
 \quad -4r \quad -4r \\
 \hline
 2 - 3r \geq -10 \\
 \quad -2 \quad \quad -2 \\
 \hline
 -3r \geq -12 \\
 \quad \frac{-3}{-3} \quad \frac{-12}{-3} \\
 \hline
 r \leq 4
 \end{array}$$

$$10) \quad -11 + 2k \leq 1 - k$$

- A)  $k \leq -24$       B)  $k \geq -24$   
 C)  $k \leq 4$         D)  $k \geq -36$

$$\begin{array}{r}
 -11 + 2k \leq 1 - k \\
 \quad \quad +1k \quad \quad +1k \\
 \hline
 -11 + 3k \leq 1 \\
 \quad +11 \quad \quad +11 \\
 \hline
 3k \leq 12 \\
 \quad \frac{3}{3} \quad \frac{12}{3} \\
 \hline
 k \leq 4
 \end{array}$$

$$11) \quad 10 - x \leq -8 - 4x$$

- A)  $x \leq -28$        B)  $x \leq -6$   
 C)  $x \leq -39$       D)  $x \geq -39$

$$\begin{array}{r}
 10 - 1x \leq -8 - 4x \\
 \quad +4x \quad \quad +4x \\
 \hline
 10 + 3x \leq -8 \\
 \quad -10 \quad \quad -10 \\
 \hline
 3x \leq -18 \\
 \quad \frac{3}{3} \quad \frac{-18}{3} \\
 \hline
 x \leq -6
 \end{array}$$

$$12) \quad -7p + 13 \geq -2 - 4p$$

- A)  $p \leq -39$       B)  $p \leq 2$   
 C)  $p \leq 5$         D)  $p \geq -39$

$$\begin{array}{r}
 -7p + 13 \geq -2 - 4p \\
 \quad +4p \quad \quad +4p \\
 \hline
 -3p + 13 \geq -2 \\
 \quad -13 \quad \quad -13 \\
 \hline
 -3p \geq -15 \\
 \quad \frac{-3}{-3} \quad \frac{-15}{-3} \\
 \hline
 p \leq 5
 \end{array}$$