

11.4 Solving, Writing and Graphing Two-Step Inequalities p. 488

- * Simplify each side of the inequality first (d.p. or c.t.)
- * add or subtract the constant on the same side as the variable
- * multiply or divide to isolate the variable
remember to flip/reverse the inequality symbol if \times or \div by a negative number

$$\begin{aligned}
 1) \quad & 2(k-5) < 6 \\
 & 2k - 10 < 6 \\
 & \quad +10 \quad +10 \\
 & \hline
 & 2k < 16 \\
 & \quad \div 2 \quad \div 2 \\
 & \hline
 & \boxed{k < 8}
 \end{aligned}$$

$$\begin{aligned}
 2) \quad & 5x + 4 \geq -14 \\
 & \quad -4 \quad -4 \\
 & \hline
 & 5x \geq -18 \\
 & \quad \div 5 \quad \div 5 \\
 & \hline
 & \boxed{x \geq -2}
 \end{aligned}$$

$$\begin{aligned}
 3) \quad & 4 - 3d \leq -9 \\
 & \quad -4 \quad -4 \\
 & \hline
 & -3d \leq -13 \\
 & \quad \div (-3) \quad \div (-3) \\
 & \hline
 & \boxed{d \geq \frac{13}{3}}
 \end{aligned}$$

$$\begin{aligned}
 4) \quad & -6y + 7 > -5 \\
 & \quad -7 \quad -7 \\
 & \hline
 & -6y > -12 \\
 & \quad \div (-6) \quad \div (-6) \\
 & \hline
 & \boxed{y < \frac{2}{3}}
 \end{aligned}$$

$$\begin{aligned}
 5) \quad & -3 \leq 0.5(8+y) \\
 & -3 \leq 4 + 0.5y \\
 & \quad -4 \quad -4 \\
 & \hline
 & -7 \leq 0.5y \\
 & \quad \div 0.5 \quad \div 0.5 \\
 & \hline
 & -14 \leq y \\
 & \boxed{-14 \leq y}
 \end{aligned}$$

$$\begin{aligned}
 6) \quad & 20 \geq -3.2(c-4.3) \\
 & 20 \geq -3.2c + 13.76 \\
 & \quad -13.76 \quad -13.76 \\
 & \hline
 & 6.24 \geq -3.2c \\
 & \quad \div (-3.2) \quad \div (-3.2) \\
 & \hline
 & \boxed{-1.95 \leq c}
 \end{aligned}$$

$$7) \quad 9x - 4x + 4 \geq 36 - 12$$

$$5x + 4 \geq 24$$

$$\begin{array}{r} -4 \\ \hline 5x \geq 20 \end{array}$$

$$\frac{5x}{5} \geq \frac{20}{5}$$

$$\boxed{x \geq 4}$$

$$8) \quad 3.6 - 0.24n < 1.2$$

$$\begin{array}{r} -3.6 \\ \hline -0.24n < -2.4 \\ -0.24 \end{array}$$

$$24 \overline{) 240}$$

$$\boxed{n > 10}$$

$$9) \quad -\frac{1}{4} \leq 4k + \frac{7}{4}$$

$$\begin{array}{r} -\frac{7}{4} \\ \hline -\frac{8}{4} \leq 4k \end{array}$$

$$-\frac{8}{4} \leq 4k$$

$$-\frac{2}{4} \leq \frac{4k}{4}$$

$$\boxed{-\frac{1}{2} \leq k}$$

$$10) \quad -5(m-2) > 30$$

$$-5m + 10 > 30$$

$$\begin{array}{r} -10 \\ \hline -5m > 20 \end{array}$$

$$\boxed{m < -4}$$

$$11) \quad 12x - 5x - 4 \geq 60 - 8$$

$$7x - 4 \geq 52$$

$$\begin{array}{r} +4 \\ \hline 7x \geq 56 \end{array}$$

$$\frac{7x}{7} \geq \frac{56}{7}$$

$$x \geq 8$$

$$\boxed{x \geq 8}$$