

8.8 (Part 2) Solving Multi-Step Inequalities

Solving multi-step inequalities is similar to solving multi-step equations.

BE SURE TO FLIP THE SIGN WHEN MULTIPLYING/
DIVIDING BY A NEGATIVE!!

Example: Solve the inequality.

$$1.) 4(x - 3) > 6$$

$$4x - 12 > 6$$

+12 +12

$$\frac{4x}{4} > \frac{18}{4 \div 2}$$

$$x > \frac{9}{2} \text{ or } 4\frac{1}{2} \text{ or } 4.5$$

$$2.) 3 < 4(x + 2)$$

$$3 < 4x + 8$$

-8 -8

$$\frac{-5}{4} < \frac{4x}{4}$$

$$\frac{-5}{4} < x$$

$$x > \frac{-5}{4} \text{ or } -\frac{1}{4}$$

or
-1.25

Example: Solve the inequality.

$$3.) 4(b - 3) \leq 72$$

$$4b - 12 \leq 72$$

+12 +12

$$\frac{4b}{4} \leq \frac{84}{4}$$

$$b \leq 21$$

$$4.) 2(x - 5) \leq 1$$

$$2x - 10 \leq 1$$

+10 +10

$$\frac{2x}{2} \leq \frac{11}{2}$$

$$x \leq \frac{11}{2} \text{ or } 5\frac{1}{2} \text{ or } 5.5$$

Example: Solve the inequality.

$$5.) -32 \leq 9(3h + 2) + 4$$

$$-32 \leq 27h + 18 + 4$$

$$\begin{array}{r} -32 \leq 27h + 22 \\ -22 \qquad -22 \end{array}$$

$$\begin{array}{r} -54 \leq 27h \\ \hline 27 \quad 27 \end{array}$$

$$-2 \leq h$$

$$\boxed{h \geq -2}$$

$$6.) 3y - 6 > 4(y - 3)$$

$$\begin{array}{r} 3y - 6 > 4y - 12 \\ -3y \qquad -3y \end{array}$$

$$\begin{array}{r} -6 > y - 12 \\ +12 \qquad +12 \end{array}$$

$$6 > y$$

$$\boxed{y < 6}$$

Example: Solve the inequality.

$$7.) 3(3r + 5) \geq 24 + 10r$$

$$\begin{array}{r} 9r + 15 \geq 24 + 10r \\ -9r \qquad -9r \end{array}$$

$$\begin{array}{r} 15 \geq 24 + r \\ -24 \quad -24 \end{array}$$

$$-9 \geq r$$

$$\boxed{r \leq -9}$$

$$8.) 6(-2z + 5) < -19z + 16$$

$$\begin{array}{r} -12z + 30 < -19z + 16 \\ +19z \qquad +19z \end{array}$$

$$\begin{array}{r} 7z + 30 < 16 \\ -30 \quad -30 \end{array}$$

$$\begin{array}{r} 7z < -14 \\ \hline 7 \quad 7 \end{array}$$

$$\boxed{z < -2}$$