

Name: _____

Date: _____

Notes

Algebra Section 6.3

Pages 369-374

Goal: "You will solve multi-step inequalities."



To Solve Multi-Step Inequalities:

Ex: $3x - 7 < 8$

$$\begin{array}{r} +7 \quad +7 \\ \hline 3x < 15 \\ \hline 3 \quad 3 \\ x < 5 \end{array}$$

Solve:

Ex: $2x - 5 \leq 23$

$$x \leq 14$$

Ex: $6y + 5 \geq 11$

$$y \geq 1$$

Ex: $-0.6(x - 5) \leq 15$

$$x \geq -20$$

Ex: $-\frac{1}{4}(p - 12) > -2$

$$p < 20$$

Ex: $6x - 7 > 2x + 17$

$$x > 6$$

Solve each equation:

$$\begin{aligned} \text{Ex: } 4(2x + 3) &= 2(4x + 5) \\ 8x + 12 &= 8x + 10 \\ \underline{-8x \quad -8x} & \\ 12 &= 10 \end{aligned}$$

No Solution

$$\begin{aligned} \text{Ex: } 3(4x + 6) &= 2(6x + 9) \\ 12x + 18 &= 12x + 18 \\ \underline{-12x \quad -12x} & \\ 18 &= 18 \end{aligned}$$

Any Number

The same principle applies with inequalities:

This means that: If you get a true statement, then any number is the solution.

If you get a false statement then there is no solution.

Solve:

$$\begin{aligned} \text{Ex: } 14x + 5 &< 7(2x - 3) \\ 14x + 5 &< 14x - 21 \\ \underline{-14x \quad -14x} & \\ 5 &< -21 \end{aligned}$$

No Solution

$$\begin{aligned} \text{Ex: } 12x - 1 &> 6(2x - 1) \\ 12x - 1 &> 12x - 6 \\ \underline{-12x \quad -12x} & \\ -1 &> -6 \end{aligned}$$

Any Number

$$\begin{aligned} \text{Ex: } 5x - 12 &\leq 3x - 4 \\ \underline{-3x \quad -3x} & \\ 2x - 12 &\leq -4 \\ \underline{+12 \quad +12} & \\ \underline{2x \leq 8} & \\ \underline{2 \quad 2} & \\ x &\leq 4 \end{aligned}$$

$$\begin{aligned} \text{Ex: } 5(m + 5) &< 5m + 17 \\ 5m + 25 &< 5m + 17 \\ \underline{-5m \quad -5m} & \\ 25 &< 17 \end{aligned}$$

No Solution

$$\text{Ex: } 1 - 8s \leq -4(2s - 1)$$

Any number

$$\text{Ex: } -7x + 2 < -5$$

$x > 1$

Ex: A gas station charges \$0.10 less per gallon if a customer purchases a car wash. What are the possible amounts of gallons of gasoline you can buy if you want to spend at most \$20 and you get a car wash?

$$1.99x + 8 \leq 20$$

$$x \leq 6.03$$

About 6 gallons or less



Ex: You are saving money for a summer camp that costs \$1800. You have \$500 saved so far and 14 more weeks to save. What are the possible average amounts you need to save per week to have the total needed for camp?

$$500 + 14x \geq 1800$$

$$x \geq 92.86$$

At least \$92.86 each week.