

Algebra 1A

Lesson 6.3

Solve Multi-Step Inequalities

Warm-Up

Solve each of the following equations.

(a) $\frac{x}{4} + 8 = 7$

$-8 \quad -8$

$4 \cdot \frac{x}{4} = -1 \cdot 4$

$x = -4$

(b) $8x - 3x - 10 = 20$

$5x - 10 = 20$
 $+10 \quad +10$

$\frac{5x}{5} = \frac{30}{5}$

$x = 6$

(c) $\frac{x}{2} - 5 = 11$

$+5 \quad +5$

$2 \cdot \frac{x}{2} = 16 \cdot 2$

$x = 32$

(d) $5x + 9 = 24$

$-9 \quad -9$

$\frac{5x}{5} = \frac{15}{5}$

$x = 3$

Example 1. Solve a Two-Step Inequality (Assignment #3-14, 17-28)

Solve and graph each inequality.

(a) $7x + 2 < -5$

$-2 \quad -2$

$\frac{7x}{7} < \frac{-7}{7}$

$x < -1$

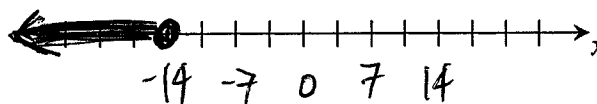
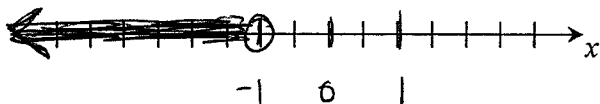
(b) $-2x - 5 \geq 23$

$+5 \quad +5$

$\frac{-2x}{-2} \geq \frac{28}{-2}$

$x \leq -14$

$x \leq -14$



Example 2. Solve an Multi-Step Inequality (Assignment #3-14, 17-28)

Solve and graph each inequality.

(a) $\frac{1}{3}(3x + 6) \leq -1$

$\frac{1}{3} \cdot 3(3x + 6) \leq -1 \cdot 3$

$x + 2 \leq -1$
 $-2 \quad -2$

$3x + 6 \leq -3$
 $-6 \quad -6$

$x \leq -3$

$\frac{3x}{3} \leq \frac{-9}{3}$

$x \leq -3$

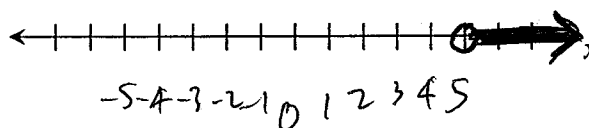
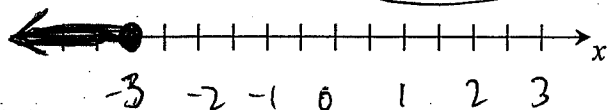
(b) $9x + 6 > 6x + 21$

$-6x \quad -6x$

$3x + 6 > 21$
 $-6 \quad -6$

$\frac{3x}{3} > \frac{15}{3}$

$x > 5$



Try It!

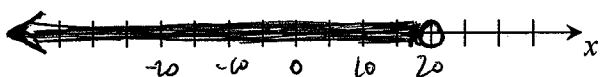
$$(a) \frac{-p}{4} + 3 > -2$$

$-3 \quad -3$

$$4 \cdot \frac{-p}{4} > -5 \cdot 4$$

$$-p > -20$$

$$p < 20$$



$$(b) 5x - 12 \leq 3x - 4$$

$-3x \quad -3x$

$$2x - 12 \leq -4$$

$+12 \quad +12$

$$\frac{2x}{2} \leq \frac{8}{2}$$

$$x \leq 4$$



Example 3. Identify the Number of Solutions of an Inequality (Assignment #17-28)

Tell whether there are no solutions or all real numbers are solutions to the given inequalities the graph.

$$(a) 8x - 4 \geq 4(2x - 1)$$

$$(b) -2x + 9 < -2(x - 3)$$

$$8x - 4 \geq 8x - 4$$

$-8x + 4 \quad -8x + 4$

$$\cancel{2x} + 9 < \cancel{-2x} + 6$$

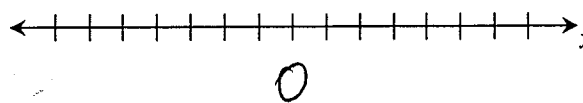
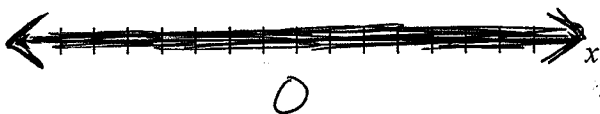
$+2x \quad +2x$

$$0 \geq 0 \quad \text{True}$$

All Real Numbers

$$9 < 6 \quad \text{False}$$

No Solutions



Example 4. Solve a Multi-Step Word Problem

You are saving money to buy gifts for your family and friends. Your plan is to spend \$300. You already have \$75 and you have four weeks left to save the rest. What are the average amounts you could save each week to make sure you have at least \$300 saved up?

$$4x + 75 \geq 300$$

$-75 \quad -75$

$$\frac{4x}{4} \geq \frac{225}{4}$$

$$x \geq 56.25$$

You must save at least \$56.25 per week.

Assignment

New: Pg. 372 #4-30 (evens)

Review:

For each of the equations below:

- a) Find the x and y intercepts
- b) Make a table of values (at least 5)
- c) Write in Slope-Intercept Form
- d) Graph

1. $2y = 4x + 8$

2. $3x - 2y - 2 = 0$

3. $2x + 2y = 5$