

Notes 5.5 – Solving Equations and Inequalities

Warmup

1. Solve for b: $y = mx + b$
 $-mx \quad -mx$

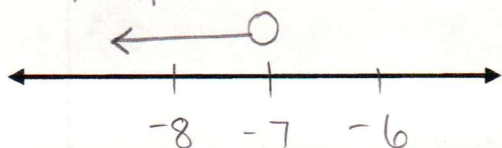
$$b = y - mx$$

2. Solve for h: $V = lwh$
 $lw \quad lw$

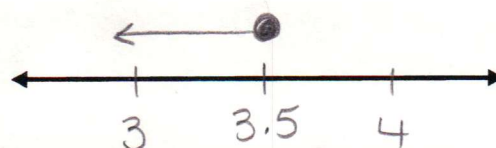
$$h = \frac{V}{lw}$$

Solve & Graph each inequality

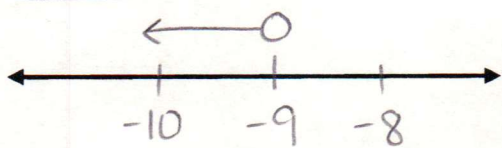
3. $8 - x > 15$
 $-8 \quad -8$
 $\frac{-x > 7}{-1 \quad -1}$
 $x < -7$



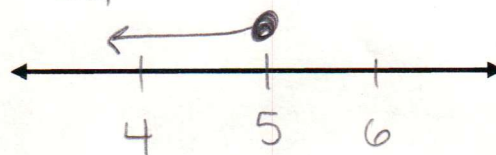
4. $x - 2.1 \leq 1.4$
 $+2.1 \quad +2.1$
 $x \leq 3.5$



5. $-3x > 27$
 $-3 \quad -3$
 $x < -9$



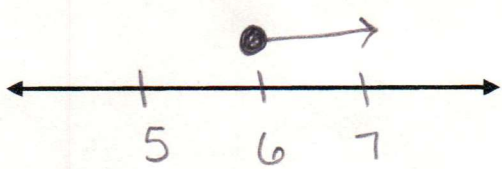
6. $-4x + 7 \geq -13$
 $-7 \quad -7$
 $\frac{-4x \geq -20}{-4 \quad -4}$
 $x \leq 5$



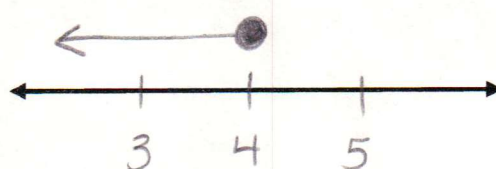
Lesson – More Solving Inequalities

Multi-Step Inequalities

a) $6x - 7 \geq 2x + 17$
 $-2x \quad -2x$
 $4x - 7 \geq 17$
 $+7 \quad +7$
 $\frac{4x}{4} \geq \frac{24}{4}$
 $x \geq 6$



b) $5x - 12 \leq 3x - 4$
 $-3x \quad -3x$
 $2x - 12 \leq -4$
 $+12 \quad +12$
 $\frac{2x}{2} \leq \frac{8}{2}$
 $x \leq 4$

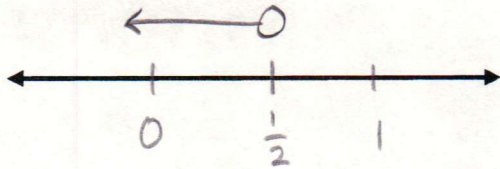


c) $-10x > 6x - 8$

$-6x - 6x$

$\frac{-16x}{-16} > \frac{-8}{-16}$

$x < \frac{1}{2}$



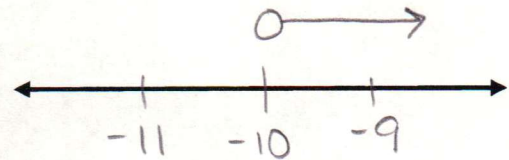
d) $-\frac{2}{3}x - 2 < \frac{1}{3}x + 8$

$+\frac{2}{3}x \quad +\frac{2}{3}x$

$-2 < x + 8$
 $-8 \quad -8$

$-10 < x$

$x > -10$



Special Cases

No Solution

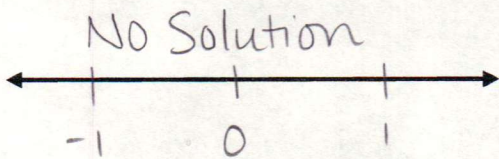
∞ solutions

e) $14x + 5 < 7(2x - 3)$

$14x + 5 < 14x - 21$

$-14x \quad -14x$

$5 < -21 \leftarrow \text{false}$

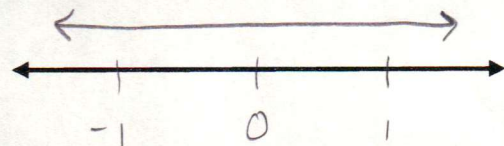


f) $12x - 1 > 6(2x - 1)$

$12x - 1 > 12x - 6$

$-12x \quad -12x$

$-1 > -6 \leftarrow \text{true}$



Context problems

Word	Meaning/Notation	Example
Interpret	Give your answer in a sentence using context.	Evan can spend up to \$10 on candy.
Interval Notation (again)	<p>does not include $\rightarrow ($</p> <p>includes $\rightarrow [$</p> <p>Start value , end value</p>	<p>\leftarrow use if does not include value</p> <p>\leftarrow use if it does include the value</p>

- g) A gas station will charge \$0.10 less per gallon if you also buy a carwash. The posted price per gallon is \$2.89. If you can spend **no more than** \$25, how many gallons could you buy?

Write and solve an inequality that models the situation.

$$\frac{2.79g}{2.79} \leq \frac{25}{2.79}$$

g = gallons of gas

$$g \leq 8.96$$

Interpret your solution.

You could buy no more than 8.96 gallons of gas.

Write your solution in interval notation.

$$[0, 8.96] \leftarrow \text{because I rounded down}$$

- h) You are saving money for a summer camp that costs \$1800. You have already saved \$500, and you have 14 more weeks to save. How much money would you need to save each week **to meet or exceed** your goal?

Write and solve an inequality that models the situation.

$$\begin{array}{r} 14w + 500 \geq 1800 \\ -500 \quad -500 \end{array}$$

$$w \geq 92.86$$

w = amount of money that needs to be saved each week

$$\frac{14w}{14} \geq \frac{1300}{14}$$

Interpret your solution.

You will need to save at least \$92.86 per week to have enough money.

Write your solution in interval notation.

$$[92.86, \infty)$$

\curvearrowright because I rounded up.