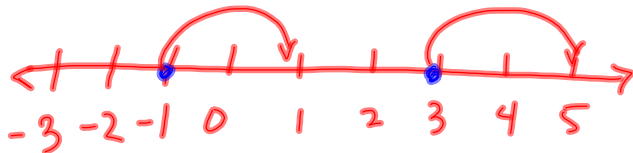


## Section 6.4 - Solving Linear Inequalities by Using Addition and Subtraction

\* consider the inequality  $-1 < 3$



\* what happens to an inequality if we add the same number to each side?

lets say we add 2 to each side:

$$-1 + 2 < 3 + 2$$

$$1 < 5$$

the resulting inequality is still true!

\* what happens to an inequality if we subtract the same number from each side?

lets say we subtract 2 from each side:

$$-1 - 2 < 3 - 2$$

$$-3 < 1$$

the resulting inequality is still true.

\*\* Property of Inequalities \*\*

⇒ when the same number is added to or subtracted from each side of an inequality, the resulting inequality is still true.

\* the strategy that we used to solve an equation can be used to solve an inequality. Isolate the variable to solve.

Equation

$$r - 6 = -2$$

$$r = -2 + 6$$

$$r = 4$$

there is only 1 solution

$$r = 4$$

Inequality

$$r - 6 < -2$$

$$r < -2 + 6$$

$$r < 4$$

any number less than 4 is part of the solution.

for example: 2, 1 and 3 are solutions.

## Ⓐ Solving an Inequality

Example 1: a) Solve the inequality  $6 \leq x - 4$   
b) graph the solution on a number line

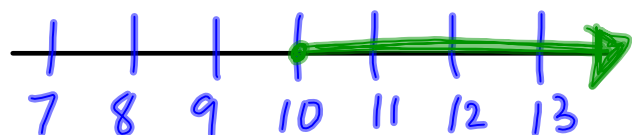
a)  $6 \leq x - 4$

$$6 + 4 \leq x$$

$$10 \leq x$$

$$\text{or } x \geq 10$$

b)



Example 2: Solve:  $6.2 \leq x - 4.5$  and graph.

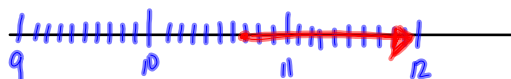
$$6.2 \leq x - 4.5 \quad \text{OR} \quad x - 4.5 \geq 6.2$$

$$6.2 + 4.5 \leq x$$

$$10.7 \leq x$$

$$x \geq 6.2 + 4.5$$

$$x \geq 10.7$$



\*how would you check your answer?

→ by filling in a possible solution:

$$6.2 \leq x - 4.5$$

$$6.2 \stackrel{?}{\leq} 11 - 4.5$$

$$6.2 \stackrel{?}{\leq} 6.5 \quad \checkmark$$

B Solving an inequality with variables on both sides

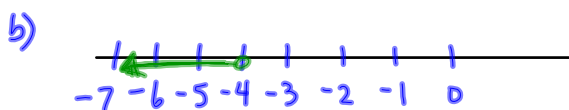
Example 1: Solve the inequality  $3d + 2 < 2d - 2$

a) graph the solution.

$$a) \quad 3d + 2 < 2d - 2$$

$$3d - 2d < -2 - 2$$

$$d < -4$$



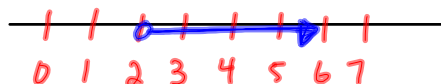
Example 2: Solve  $4 - 4x > 6 - 5x$  and graph

$$4 - 4x > 6 - 5x$$

$$-4x + 5x > 6 - 4$$

$$x > 2$$

$\leq \cdot$   
 $\geq \cdot$   
 $>$   
 $<$



Ⓒ Using an Inequality to model and solve a problem

Example: pg 297 ex 2

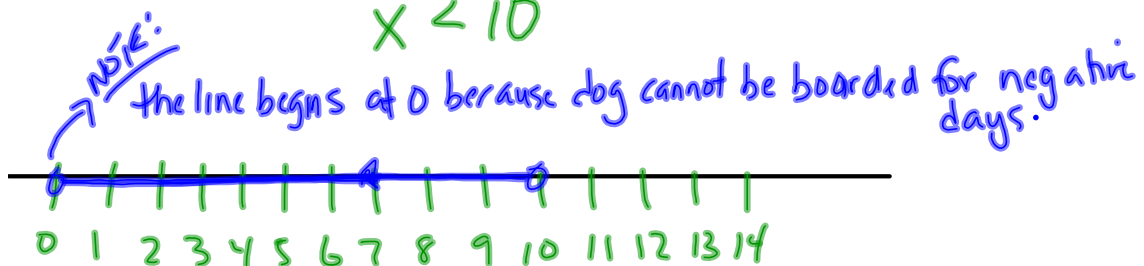
$$A = 90 \text{ plus } \$5 \text{ a day} = 90 + 5x$$

$$B = 100 \text{ plus } \$4 \text{ a day} = 100 + 4x$$

$$(90) + 5x < 100 + (4x)$$

$$5x - 4x < 100 - 90$$

$$x < 10$$



boarding house A is less expensive if Jake leaves his dog for less than 10 days

Complete: pg 298-299

#'s: 5, 7, 8, 9, 10, 12, 13.