

Prepare for a quiz....

# Quiz

February 10, 2015

To be completed and handed in.



$$(6) \quad \frac{3(1 + 3r)}{2} = \frac{2(2 - 3r)}{3}$$



$$6 \left( \frac{3}{2} \right) (1 + 3r) = 6 \left( \frac{2}{3} \right) (2 - 3r)$$

$$9(1 + 3r) = 4(2 - 3r)$$

$$9 + 27r = 8 - 12r$$

$$27r + 12r = 8 - 9$$

$$\frac{39r}{39} = \frac{-1}{39}$$

$$r = -\frac{1}{39}$$



Method 1)  
Answer

$$\frac{3}{2}(1 + 3r) = \frac{2}{3}(2 - 3r)$$

$$\frac{3}{2} + \frac{9r}{2} = \frac{4}{3} - \frac{6r}{3}$$

$$\frac{3^6}{2} + \frac{9r^6}{2} = \frac{4^6}{3} - \frac{6r^6}{3}$$



$$\frac{18}{2} + \frac{54r}{2} = \frac{24}{3} - \frac{36r}{3}$$

$$9 + 27r = 8 - 12r$$

$$27r + 12r = 8 - 9$$

$$\frac{39r}{39} = \frac{-1}{39}$$

$$r = -0.03$$

Method 2)

Answers

$$\frac{3}{2}(1 + 3r) = \frac{2}{3}(2 - 3r)$$

$$9(1 + 3r) = 4(2 - 3r)$$

$$9 + 27r = 8 - 12r$$

$$27r + 12r = 8 - 9$$

$$\frac{39r}{39} = \frac{-1}{39}$$

$$r = -0.03$$



# Introduction to Linear Inequalities



**What is an inequality?**

Tallest man  
7 feet 9 inches  
or 2.36m tall  $>$  Smallest man  
29 inches  
or 0.74m tall

We use inequalities to model situations that can be described by a range of numbers instead of a single number.



"Pick a number greater than 7."



Define a variable and write an inequality for each of the following situation:



Variable:  $s$ , speed 


Inequality:  $s \leq 55$



Variable:  $t$ , temperature 


Inequality:  $t < 4^{\circ}\text{C}$



Variable:  $h$ , height 

Inequality:  $h \geq 102\text{ cm}$



Variable:  $a$ , age 

Inequality:  $a \geq 14$

**CAPTAIN ANSWER**

## Determining whether a number is a solution to an inequality

Is each number a solution of the inequality  $b \geq -4$ ?

~~-8~~    $-3.5$     $-4$     ~~$-4.5$~~     $0$

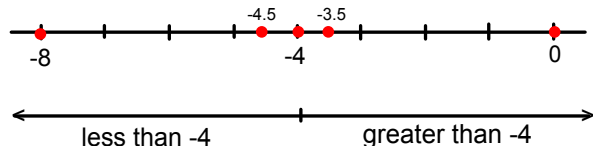
We can do this in TWO different ways:



### Method 1: Using a Number Line

Show all numbers on a line.

The solution of  $b \geq -4$  is all numbers that are greater than (to the right) or equal to  $-4$ .



For a number to be greater than  $-4$ , it must lie to the right of  $-4$ .

- a)  $-8$  is to the left of  $-4$ , so  $-8$  is **not** a solution
- b)  $-3.5$  is to the right of  $-4$  so  $-3.5$  **is** a solution
- c)  $-4$  is equal to itself, so it **is** a solution
- d)  $-4.5$  is to the left of  $-4$ , so  $-4.5$  is **not** a solution
- e)  $0$  is to the right of  $-4$ , so  $0$  **is** a solution

### Method 2: Use Substitution.

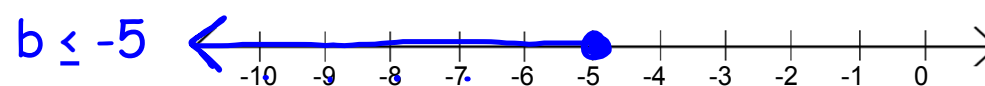
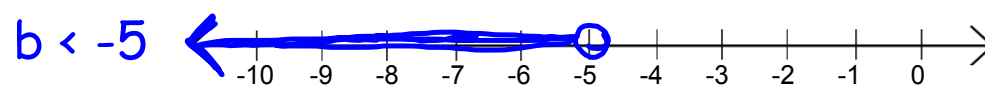
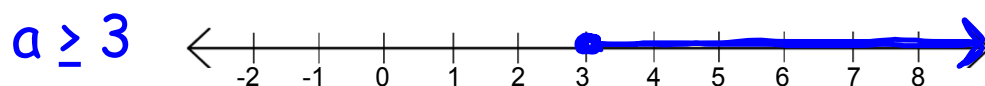
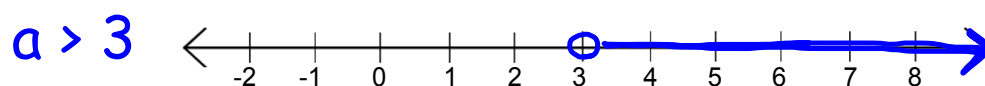
Substitute each number for  $b$  in the inequality  $b \geq -4$ .

Determine whether the resulting inequality is true or false.

- a) Since  $-8 \geq -4$  is false,  $-8$  is not a solution.
- b) Since  $-3.5 \geq -4$  is true,  $-3.5$  is a solution.
- c) Since  $-4 = -4$ ,  $-4$  is a solution.
- d) Since  $-4.5 \geq -4$  is false,  $-4.5$  is not a solution.
- e) Since  $0 \geq -4$  is true,  $0$  is a solution.



# Graphing inequalities



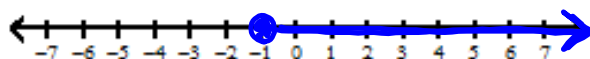
You try

think!  
think!  
think!



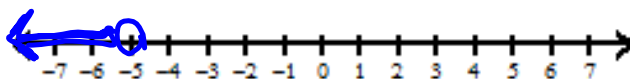
1)

$$k \geq -1$$



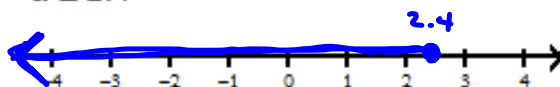
2)

$$x < -5$$

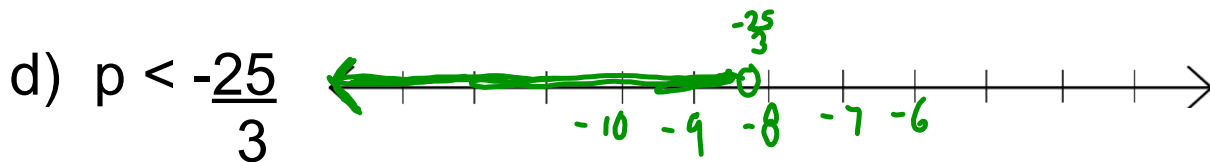
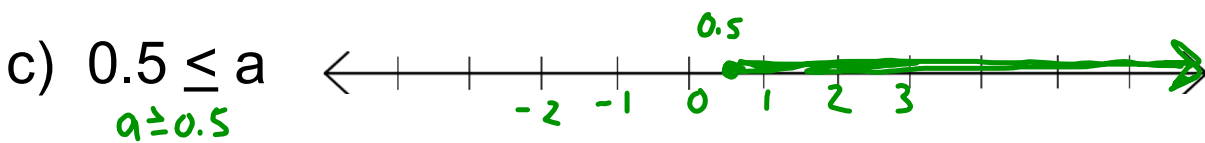
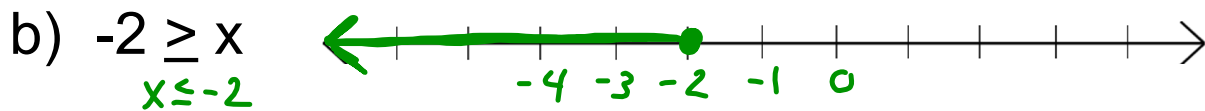
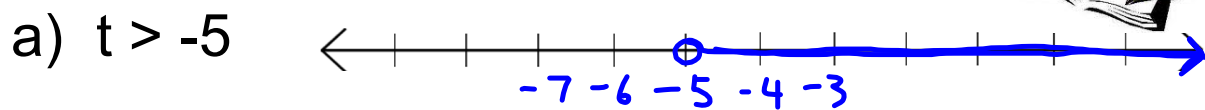


3)

$$a \leq 2.4$$

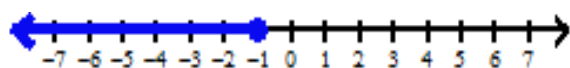


Graph each inequality on a number line.  
Write 4 numbers that are solutions of the inequality.



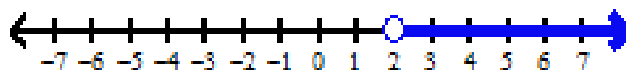
Write the inequality given by the following graph.

1)



$$x \leq -1$$

2)



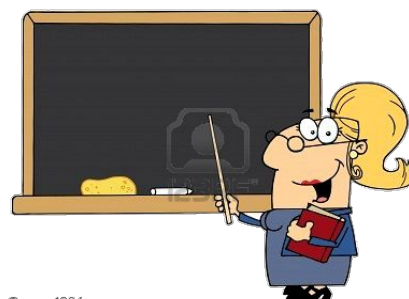
$$x > 2$$



# Class/Homework

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3 aceg 12  
4 13aceg  
6ac  
7  
8  
9



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$$1) \frac{3}{4}(2x + 1) = \frac{2}{3}(x - 4)$$