

## Curriculum Outcome

PR1: . Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

PR3. Model and solve problems using linear equations of the form:

$$ax = b; = b, a \neq 0; ax + b = c; +b = c, a \neq 0; = b, x \neq 0 \quad ax \quad ax \quad xa$$

$$ax + b = cx + d; a(bx + c) = d(ex + f); a(x + b) = c; ax = b + cx$$

concretely, pictorially and symbolically, where  $a, b, c, d, e,$  and  $f$  are rational numbers

Student Friendly: Replacing the equal sign with an inequality sign (ie.  $<$ ,  $>$ )

$$\begin{array}{l} > \\ < \\ \geq \\ \leq \end{array}$$

*Warm Up*

**Quiz Time**

## Section 6.3

# Introduction to Linear Inequalities



Tallest man  
7 feet 9 inches  
or 2.36m tall

>

Smallest man  
29 inches  
or 0.74m tall



## What is an inequality?

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."

$$x > 7$$

# When one quantity is....



less than



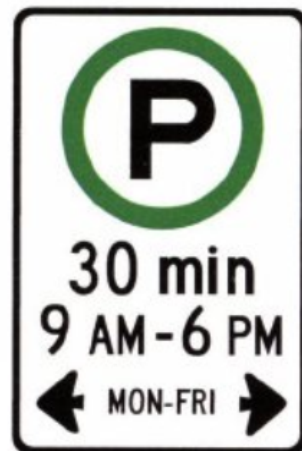
greater than



less than or equal to



greater than or equal to



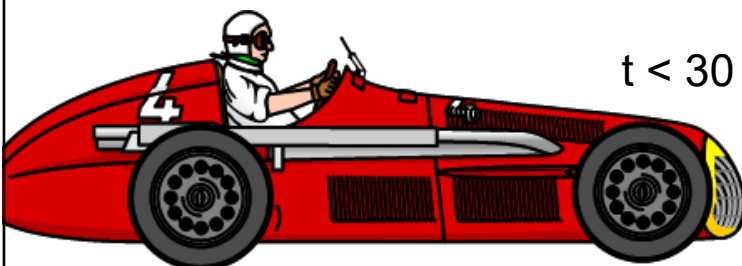
Which of these inequalities describes the time,  $t$  minutes, for which a car could be legally parked?

$$t > 30$$

$$t \geq 30$$

$$t < 30$$

$$t \leq 30$$



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



Variable:  $s$ , speed

Inequality:  $s \leq 55$



Store at  
temperatures below  
4°C

Variable:  $t$ , temperature

Inequality:  $t < 4$



Variable:  $h$ , height

Inequality:  $h \geq 102$



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

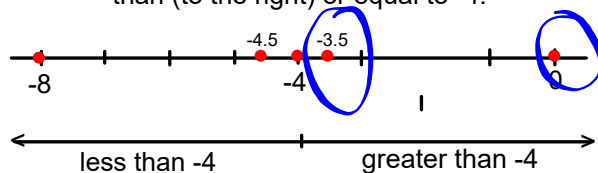
We can do this in TWO different ways:



### 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  $b \geq -4$ .

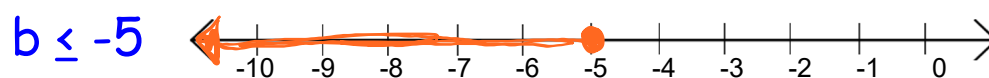
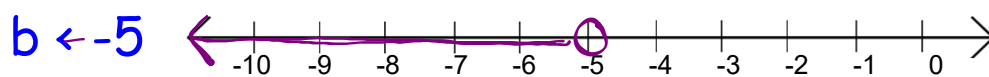
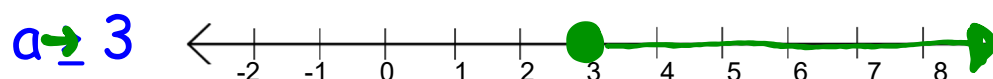
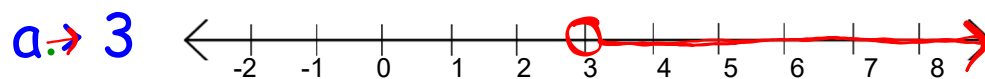
Determine whether the resulting inequality is true or false.

- 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.

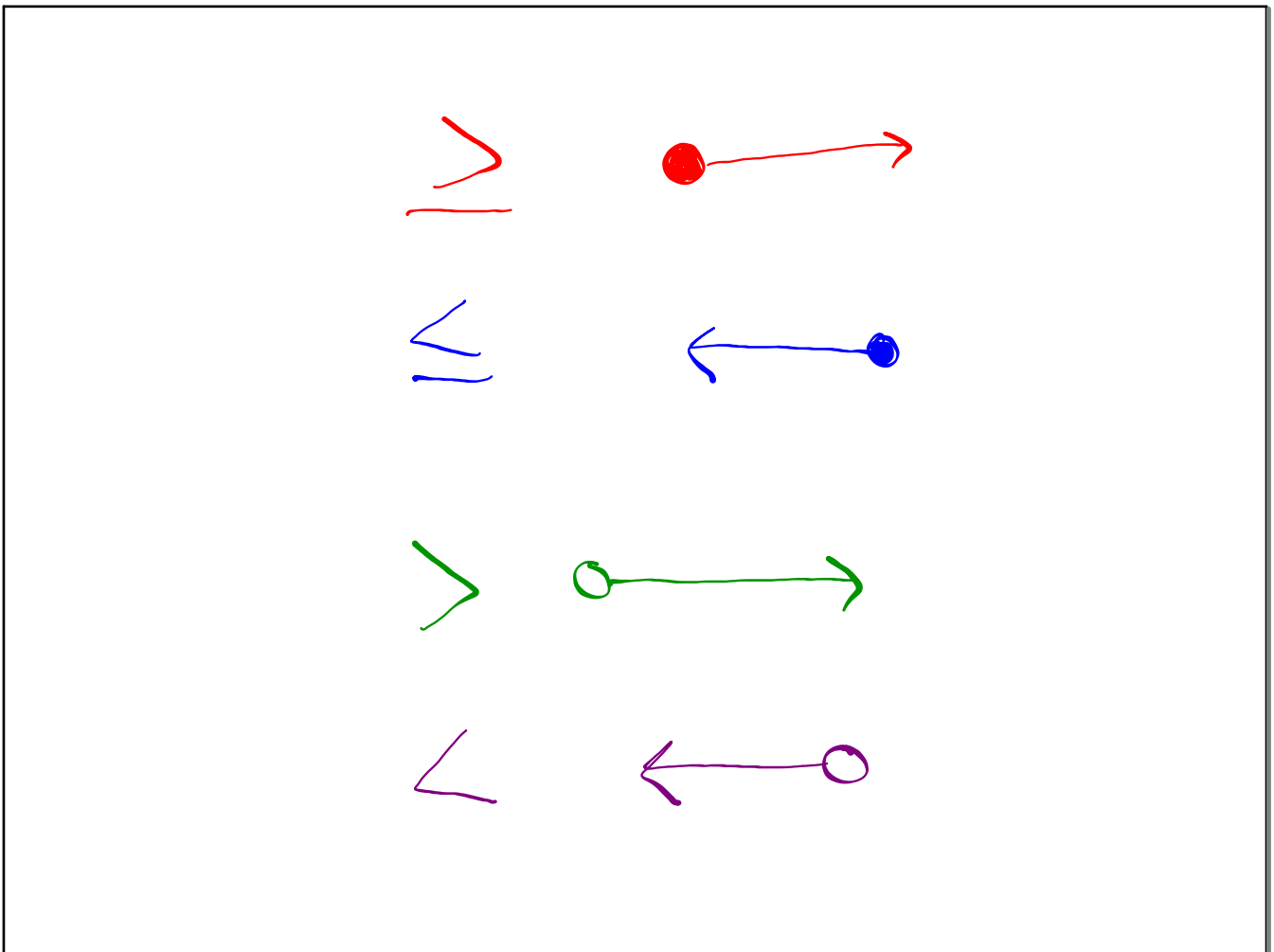
$$t < 6$$

7, 5, 3, 10

## Graphing inequalities

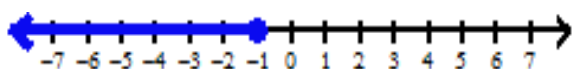






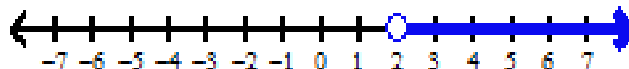
Write the inequality given by the following graph.

1)



$$t \leq -1$$

2)

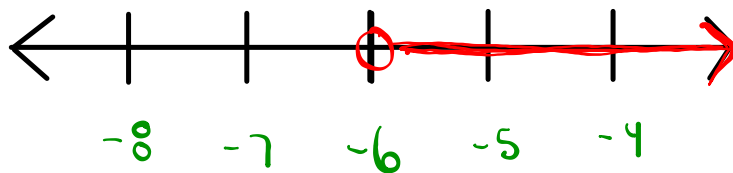


$$x > 2$$



$$-6 < t$$

$$t > -6$$

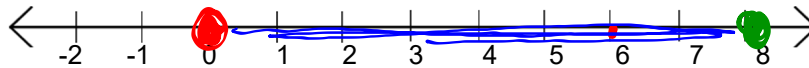


# Graphing inequalities

$$-2 < p < 3$$



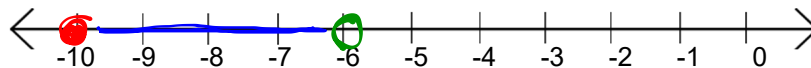
$$0 \leq a \leq 8$$



$$-5 < t \leq -2$$



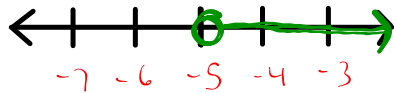
$$-10 \leq g < -6$$



Graph each inequality on a number line.



a)  $t > -5$



b)  $-2 \geq x$

$x \leq -2$

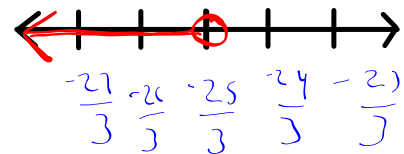


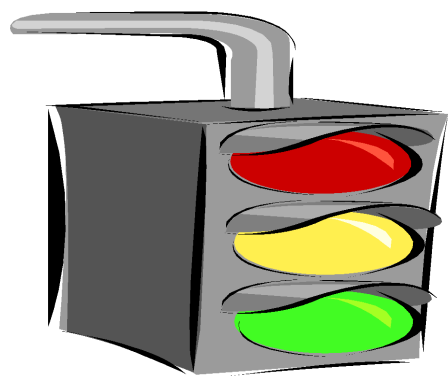
c)  $0.5 \leq a$

$a \geq 0.5$

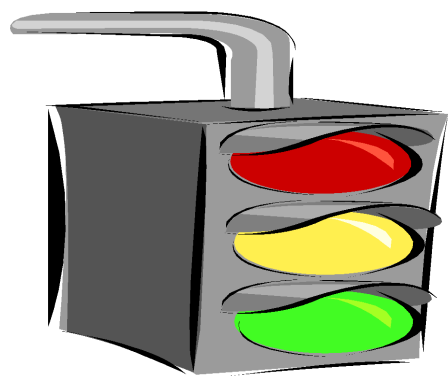


d)  $p < \frac{-25}{3}$





Now it is  
time for  
Home  
Learning



# Class/Homework

**PAGE 292-293**

**QUESTIONS**

3aceg,4,7ac,  
8,9,12,13aceg