

**LEARNING OBJECTIVE:** We will solve word problems involving inequalities and graph a solution. (G7M3L12)

**CONCEPT DEVELOPMENT:**

When solving an inequality, we graph the solution on a number line. WHY?

*There is more than one solution.*

Example: Malik keeps at least \$150 in his savings account at all times.

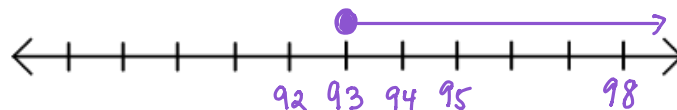


**GRAPHING INEQUALITY REVIEW**

If your inequality IS a part of the solution set, your graph should begin with a CLOSED CIRCLE. This is associated with the inequality symbols:  $\leq$  and  $\geq$ .

Example: Winnie will score at least a 93 on her next math test.

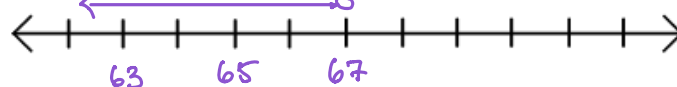
$$t \geq 93$$



If your inequality IS NOT a part of the solution set, your graph should begin with an OPEN CIRCLE. This is associated with the inequality symbols:  $<$  and  $>$ .

Example: The temperature will be less than 67 degrees tomorrow.

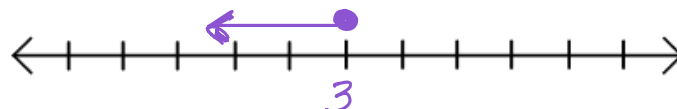
$$t < 67$$



If the inequality symbol in your solution set is less than or less than or equal to ( $<$  and  $\leq$ ), your arrow will be pointing left.

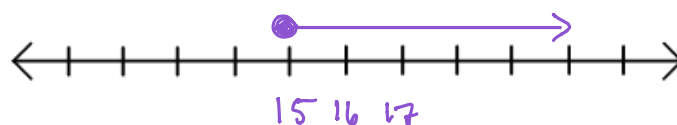
Example: Mr. Rogove will drink no more than 3 cups of coffee today.

$$c \leq 3$$



If the inequality symbol in your solution set is greater than or greater than or equal to, your arrow will be pointing right.

Example: Riley will score at least 15 points in the basketball game.

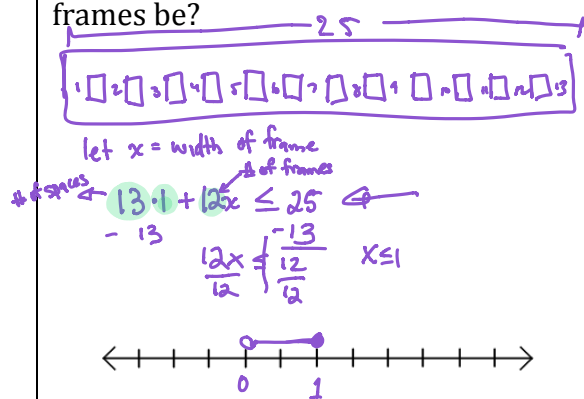


**GUIDED PRACTICE:**

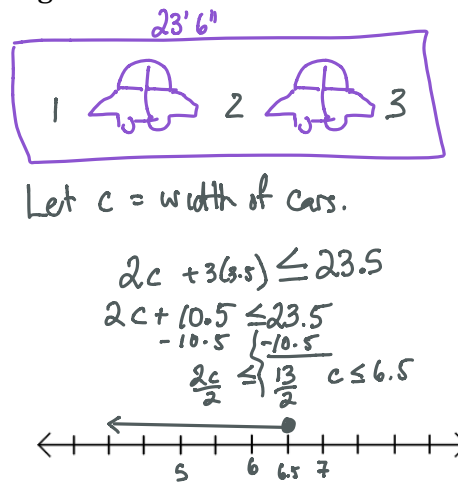
**Steps to Solving and Graphing Inequalities**

1. Read the problem carefully and write an inequality that describes the situation.
2. Perform if-then moves to solve the inequality.
3. Interpret your answer in the context of the problem.
4. Graph your solution on a number line.

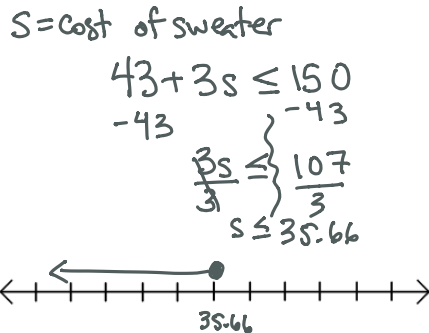
You are trying to fill up space on a 25 foot wall, and so you decide to hang up framed pictures of yourself throughout the years. You have 12 great pictures. You want there to be at least ~~12 inches~~<sup>1 foot</sup> of space between each frame, and the same amount of space between the edge of the wall and the picture. How wide can the frames be?



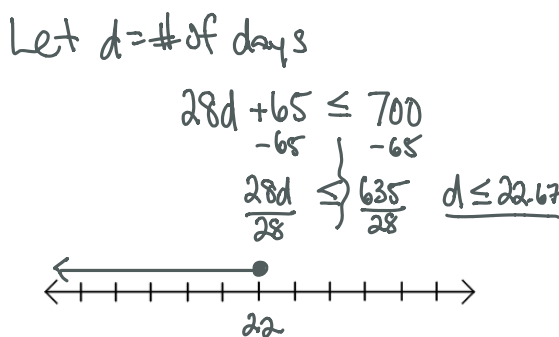
Two identical cars need to fit into a garage. The opening is 23 feet 6 inches wide and there must be at least 3 feet 6 inches of clearance (space) between the cars and between the edges of the garage. How wide can the cars be?



Quincy goes to Macy's and wants to buy three sweaters and a pair of jeans. She has \$150 in her wallet. The jeans are \$43. What is the most she could possibly pay for a sweater?



The cost of renting a car is \$28 per day, but there's also a one-time charge for insurance of \$65. How many days can the car be rented if you don't want your total cost to be more than \$700?



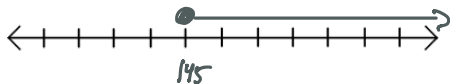
Ms. Galassi and Mr. Mulkey both commit to mastering at least 314 Khan Academy skills this year. If Ms. Galassi masters 25 fewer skills than Mr. Mulkey, what's the least number of skills that Ms. Galassi will have mastered this year?

Let  $g = \#$  of skills Galassi masters  
 $g+25 = \text{Mulkey Skills}$

$$g + g + 25 \geq 314$$

$$2g + 25 \geq 314$$

$$-25 \quad \left\{ \begin{array}{l} -25 \\ \hline 289 \\ \hline 2 \end{array} \right. \quad g \geq 144.5$$



Sydney and Madison decided to do community service this year, and they have committed to doing at least 250 hours of community service over the course of the year. If Sydney ends up doing 20 fewer hours of community service than Madison, what is the least number of hours that Sydney will volunteer?

Let  $m = \text{hrs Madison did.}$   
 $m - 20 = \text{Sydney}$

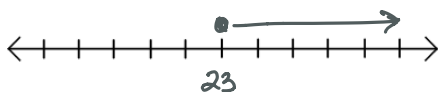
$$2m - 20 \geq 250$$

$$+20 \quad \left\{ \begin{array}{l} +20 \\ \hline 270 \\ \hline 2 \end{array} \right. \quad m \geq 135$$



Gary is a server at a local restaurant. He gets paid \$15.50 each hour, and each week, makes \$50 in tips. How many (full) hours does he need to work to earn more than \$400?

$$h > 22.58$$



Ben has agreed to play less video games and spend more time studying. He has agreed to play less than 10 hours of video games each week. On Monday through Thursday, he played video games for a total of  $5\frac{1}{2}$  hours. For the remaining 3 days, he plays for the same amount of time each day. What is the longest he can play each day?

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



NAME: \_\_\_\_\_

Math 7.1

Mr. Rogove

Date: \_\_\_\_\_

**INDEPENDENT PRACTICE:**

For independent practice, complete the matching activity that accompanies lesson 15.

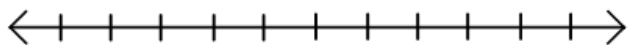
**ACTIVATING PRIOR KNOWLEDGE:**

We can perform if-then moves to solve inequalities.

$-2x + 3 \geq 11$	$3x - 5 < 16$
-------------------	---------------

**CLOSURE:**

A bank account has \$650 in it. Every week Mark withdraws \$50 to pay a gardener for mowing grass and maintaining his yard. What is the maximum number of weeks that Mark can withdraw money so there is at least \$75 in the account? Write an inequality, solve it, and graph the solution.



**TEACHER NOTES:**

This aligns with lesson 15 from ENY grade 7 module 3.