

Warmup 10/(9 + 10) Created by Kimia

FOR EACH:

- What form is it in?
- What is the slope?
- What is the y-intercept?

1) $2x - 3y = 3$

2) $y - 5 = \frac{1}{4}(x - 16)$

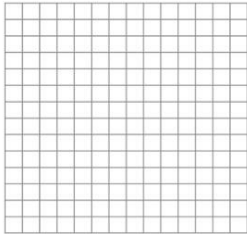
3) $y = -\frac{3}{5}x$

- Solve the inequality. Then graph the solution.

$$-5(x - 6) \leq 3x + 9 - x$$

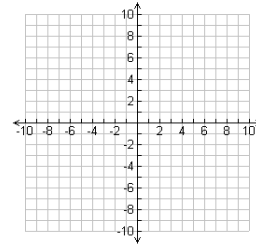
What does it mean when we graph?

$$y = 3x + 25$$



What does it mean when we graph?

$$y = 4x$$



- So far, we have solved & graphed inequalities with one variable, like the one in the warmup...



DISCUSS:

- What does this graph represent?
- What do you think the graph of a two variable inequality would look???

Solving Linear Inequalities

Objective:

- Use graphing to solve linear inequalities in two variables

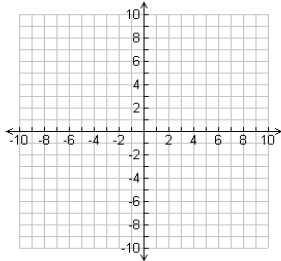
An example of a two-variable inequality..

- Come up with **three** solutions **(x, y)** to the following inequality:

$$y < x + 5$$

- I will mark all of your solutions on the big graph...

- What do you notice about the graph? Any connections you can make???



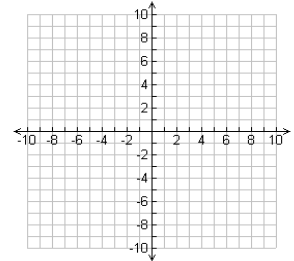
An example of a two-variable inequality..

- Come up with **three** solutions **(x, y)** to the following inequality:

$$y \geq 2x + 3$$

- I will mark all of your solutions on the big graph...

- What do you notice about the graph? Any connections you can make???



Graphing Linear Inequalities

- Graph the "boundary line", dotted or solid
- Shade the correct side of the line

Tips

- \leq or \geq : **Solid line**
- $<$ or $>$: **Dotted line**
- $y <$ or $y \leq$: **Shade below**
- $y >$ or $y \geq$: **Shade above**
- **HELPFUL HINT:**
 - Check your answer by substituting an easy point like (0, 0)

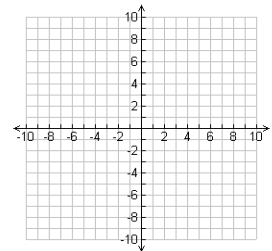
- Graph the inequality:

$$y \leq -\frac{1}{3}x - 3$$

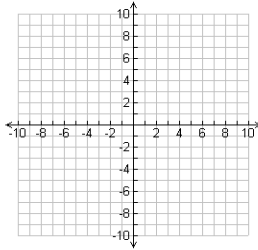
$$y = 3x + 25$$

- Graph the inequality:

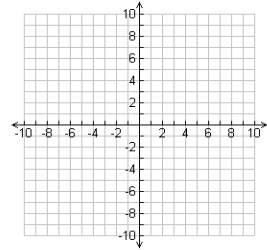
$$3x + 2y > 6$$



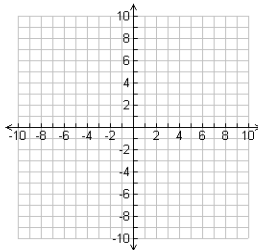
- Graph the inequality:
 $10 - 2y \geq 6x$



- Graph the inequality:
 $y < 7$



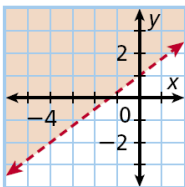
- Graph the inequality:
 $x \geq -3$



Horizontal & Vertical Lines

- $y = \text{number}$: horizontal
- $x = \text{number}$: vertical

Write an inequality to represent the graph.



y -intercept: 1; slope: $\frac{3}{4}$

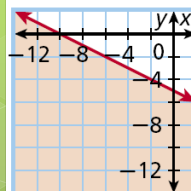
Write an equation in slope-intercept form.

$$y = mx + b \rightarrow y = \frac{3}{4}x + 1$$

The graph is shaded *above* a *dashed* boundary line.

Replace = with > to write the inequality $y > \frac{3}{4}x + 1$.

Write an inequality to represent the graph.



y -intercept: -5 slope: $-\frac{1}{2}$

Write an equation in slope-intercept form.

$$y = mx + b \rightarrow y = -\frac{1}{2}x - 5$$

The graph is shaded *below* a *solid* boundary line.

Replace = with \leq to write the inequality $y \leq -\frac{1}{2}x - 5$.

Ada has at most 285 beads to make jewelry. A necklace requires 40 beads, and a bracelet requires 15 beads.

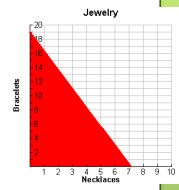
Write a linear inequality to describe the situation.

Let x represent the number of necklaces and y the number of bracelets.

Write an inequality. Use \leq for "at most."

Graph the solutions.

Shade below the line. Ada can only make whole numbers of jewelry. All points on or below the line with whole number coordinates are the different combinations of bracelets and necklaces that Ada can make.



Homework/Classwork