

Algebra RH

Essential Question: How do we graph linear inequalities?

Do Now: Determine whether each of the following ordered pairs is a solution to the linear inequality $x - 2y \geq 5$.

a. (2, -3)

$$(2) - 2(-3) \geq 5$$

$$2 + 6 \geq 5$$

$$8 \geq 5$$

✓

b. (0, 0)

$$(0) - 2(0) \geq 5$$

$$0 \geq 5$$

X

c. (1, -2)

$$1 - 2(-2) \geq 5$$

$$1 + 4 \geq 5$$

$$5 \geq 5$$

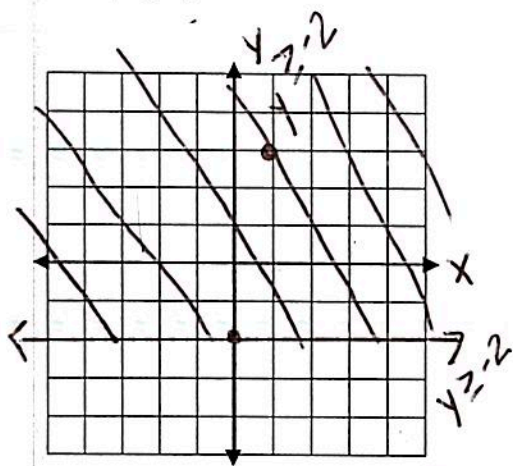
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Graphing Linear Inequalities

- Graph the corresponding linear equation
- Use a ---- line for $<$, $>$ and a solid line — for \leq , \geq
- Test a point on either half plane using the original inequality
- Shade solution set
- *Short-cut to shading: When using $>$, \geq , shade above the line
When using $<$, \leq , shade below the line*

Examples:

1. Graph $y \geq -2$



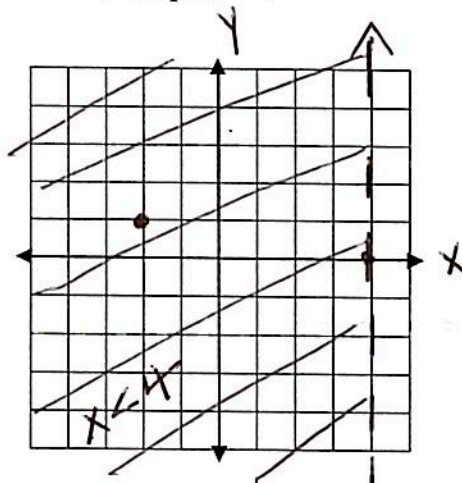
test point (1, 3)

$$y \geq -2$$

$$3 \geq -2$$

✓

2. Graph $x < 4$



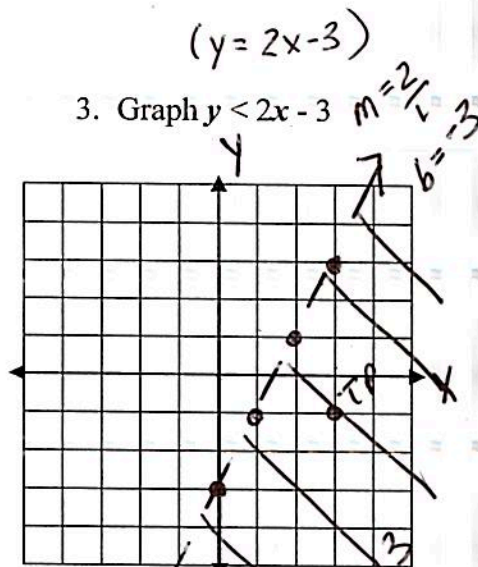
test point (-2, 1)

$$x < 4$$

$$-2 < 4$$

✓

3. Graph $y < 2x - 3$



test point (3, -1)

$$y < 2x - 3$$

$$-1 < 2(3) - 3$$

$$-1 < 3 \quad \checkmark$$

4. Graph $4x + 8y < -16$

$$8y < -4x - 16$$

$$y < -\frac{1}{2}x - 2$$

$$m = -\frac{1}{2}$$

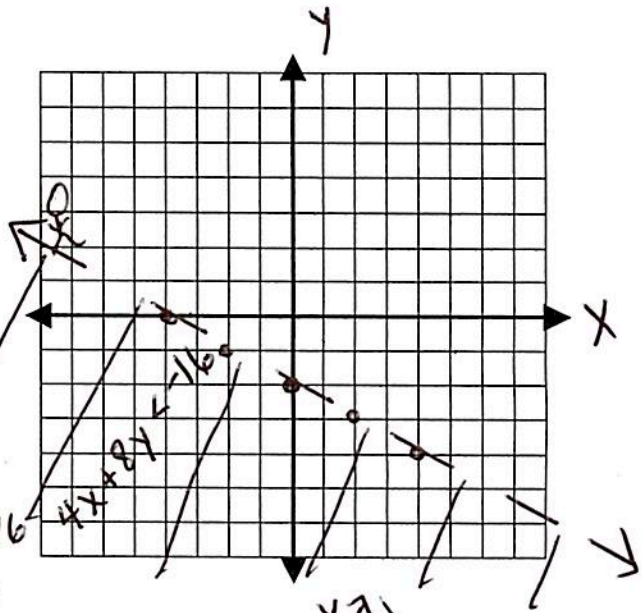
$$b = -2$$

test point
(0,0)

$$4x + 8y < -16$$

$$4(0) + 8(0) < -16$$

$$0 < -16$$



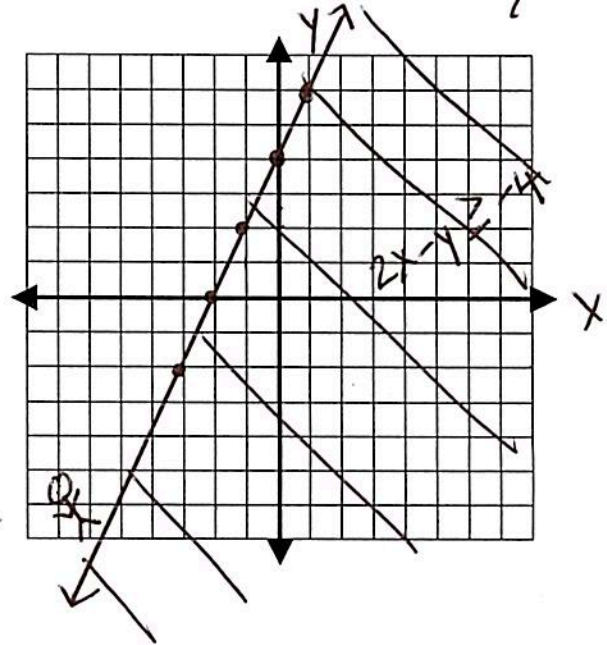
5. Graph $2x - y \geq -4$

$$\frac{-y}{-1} \geq \frac{-2x - 4}{-1}$$

$$y \leq 2x + 4$$

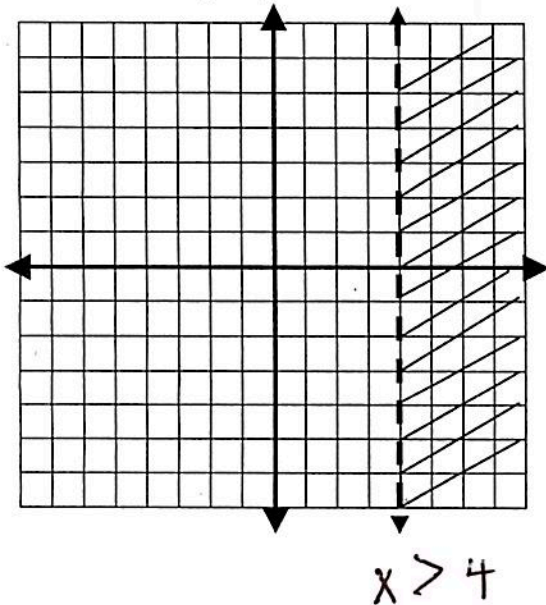
$$m = \frac{2}{1} = \frac{-2}{-1}$$

$$b = 4$$



6. Write the linear inequalities for the given graphs.

a.



b.

