

Unit 3b Day 11: Graphing Linear Inequalities

Focus Question: How do I graph an inequality?

A. Equations and Inequalities

1. Equations use what symbol? =

2. What symbols do inequalities use and what do they mean?

< less than

≤ less than or equal to

> greater than

≥ greater than or equal to

3. What does it mean to be a solution?

when you substitute the "equation" is true
"inequality"

4. How many solutions do inequalities have?

∞

B. Graphing 1 variable inequalities.

1. Because there is only 1 variable, only 1 number line is required.

2. For each inequality or equation below, change it to interval notation and graph it on a number line.

open
 $x > 4$ (4, ∞)

closed
 $y ≤ -3$ (-∞, -3]

$z = 2$ [2]



$a < 5$
open



$b ≥ -10$



$6 ≥ h$ or $h ≤ 6$
closed

(-∞, 5)



C. Graphing 2 Variable Inequalities

1. Graphing a 2 variable inequality requires 2 number line(s).

(this is also known as a graph)

Therefore, you **graph it exactly like a line** with the following exceptions.

- If the symbol is $<$ or $>$ you used a dashed line.
- You shade the side of the line that gives the many solutions to the inequality.

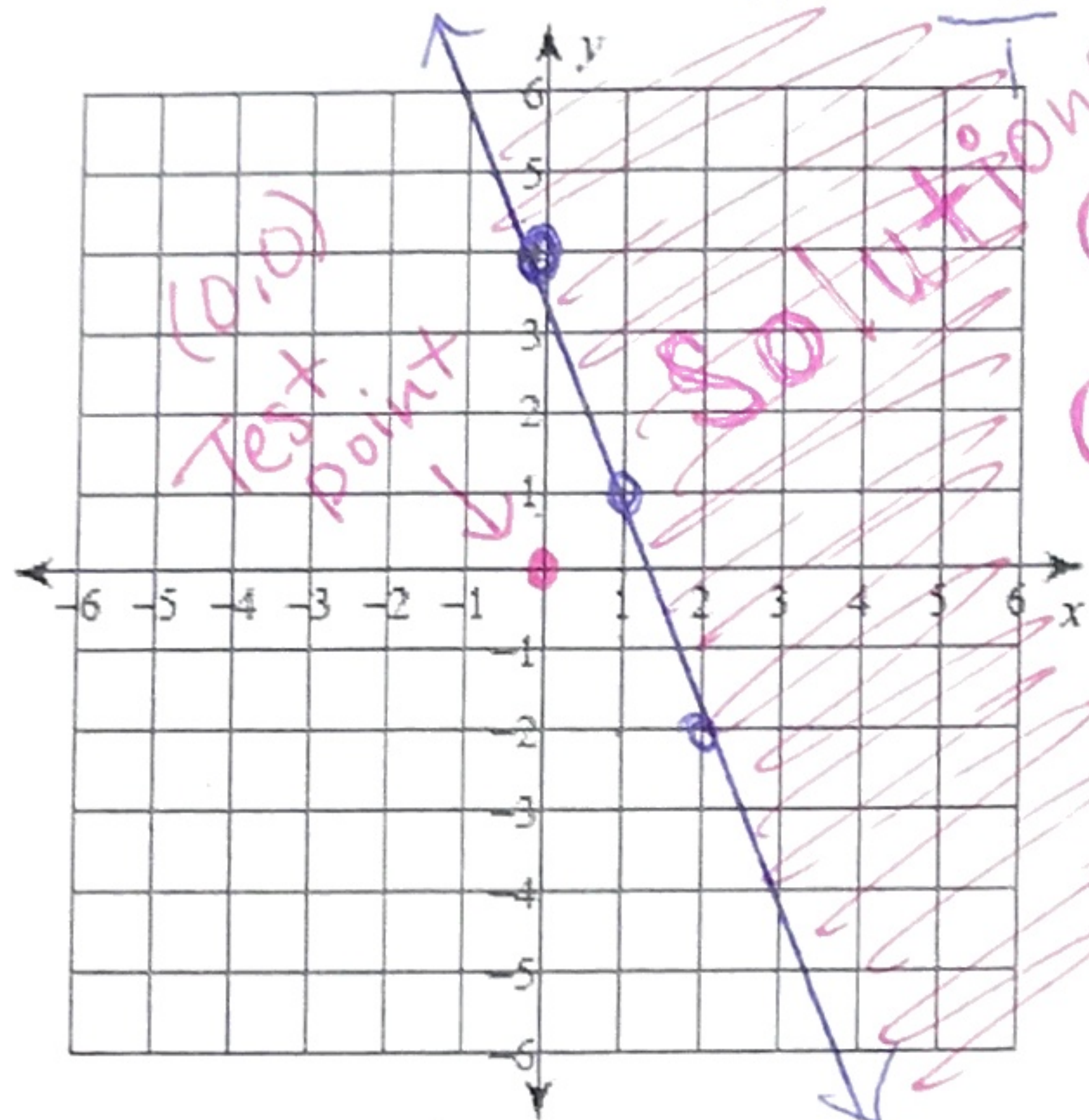
You have to show a point that you tested (using substitution) in order to determine if it is the side of the solutions!

solid

2. Graph the following linear inequalities.

1) $y \geq -3x + 4$

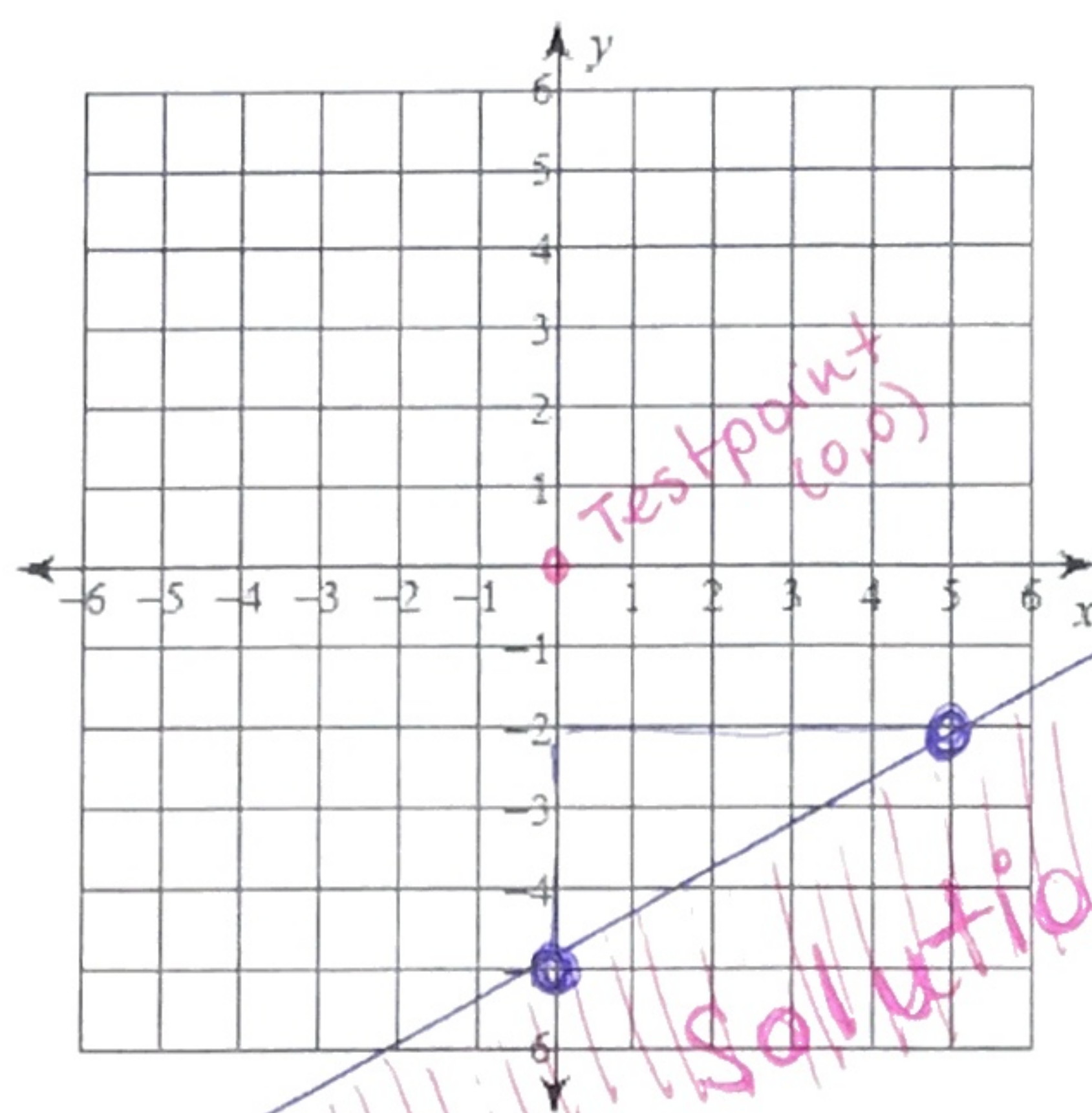
$m = -3$ $b = 4$



solid

2) $y \leq \frac{3}{5}x - 5$

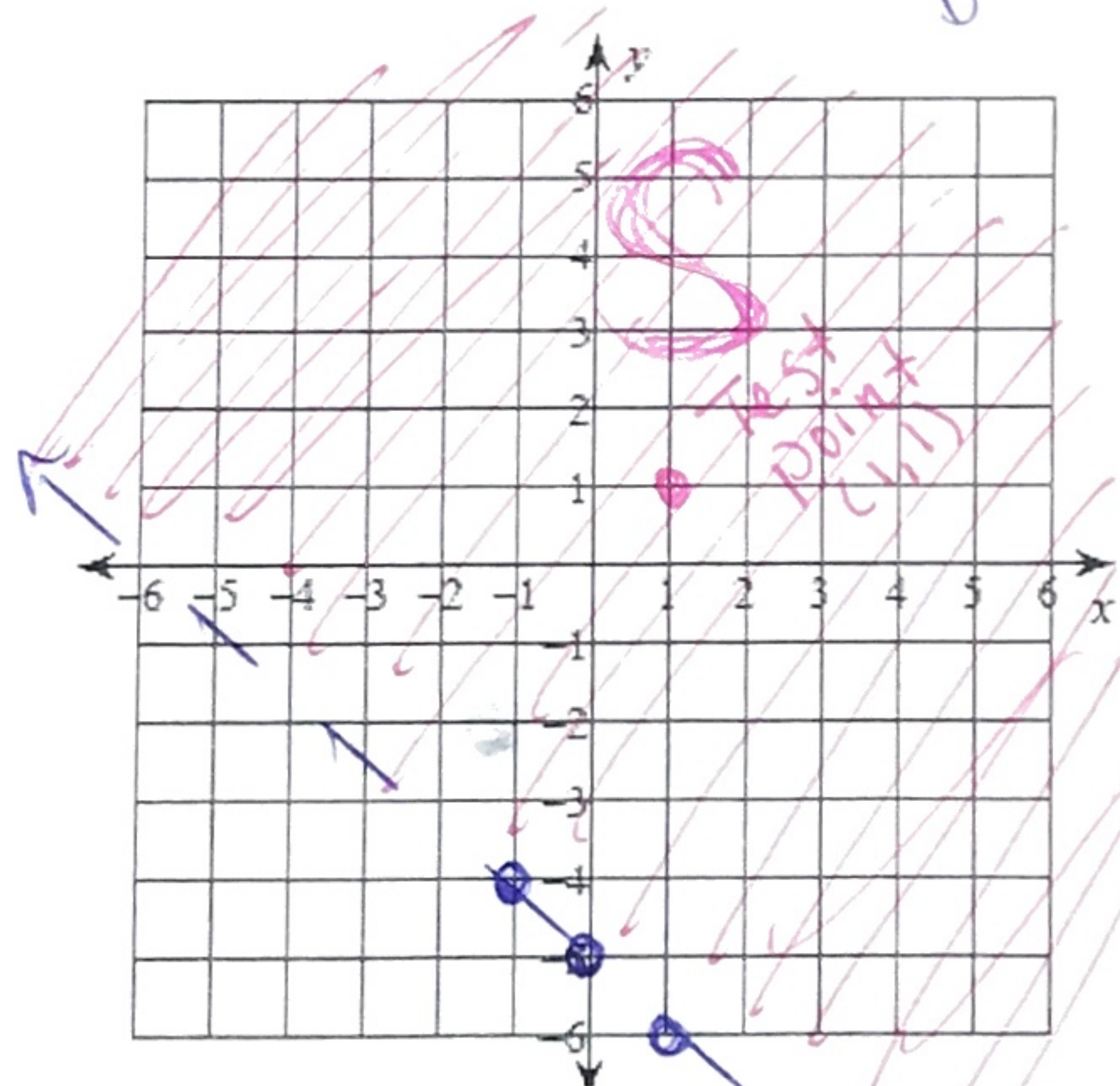
$m = \frac{3}{5}$ $b = -5$



dashed

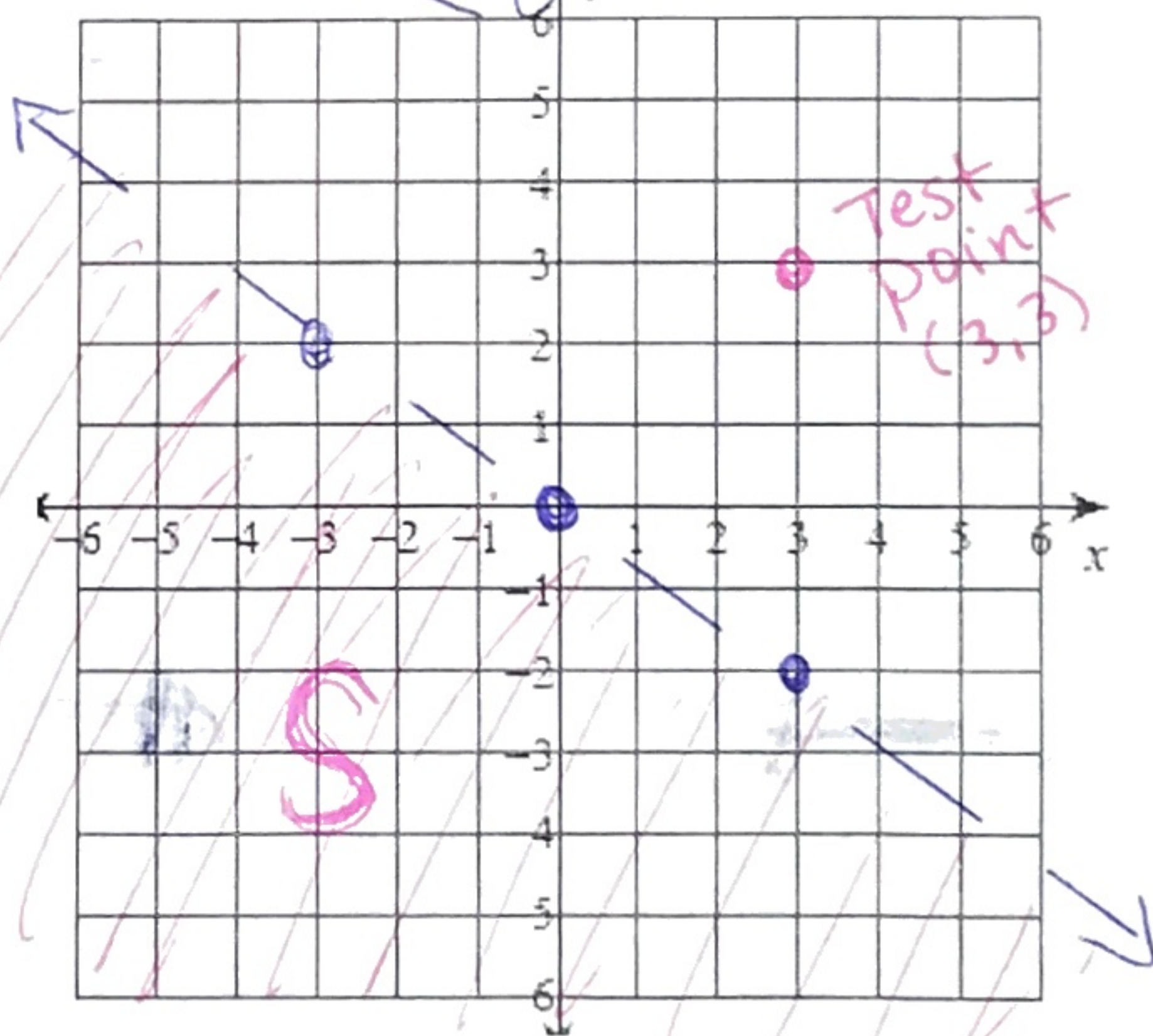
3) $y > -x - 5$

$m = -1$ $b = -5$



4) $f(x) < -\frac{2}{3}x$

$m = -\frac{2}{3}$ $b = 0$



5. For a fundraiser, students offer a basic car wash for \$2 and a deluxe car wash for \$5. They want to make at least \$75. Write an inequality that shows the possible combinations of washes needed to earn their goal.

x : # of basic washes

y : # of deluxe washes

$y = mx + b$

$2x + 5y \geq 75$

$2(0) + 5(0) \geq 75$
 $0 \geq 75$
False

$5y \geq -\frac{2x}{5} + \frac{75}{5}$

$y \geq -\frac{2}{5}x + 15$

