WARM UP!

Solve for h, $ah-g=b$.

$ah - g = b$

$+g \quad +g$

$\frac{ah}{a} = \frac{b+g}{a}$

$h = \frac{b+g}{a}$

What is the value of the expression when $a = 3$ and $b = -2$?

$5b^2 - 3a - 5$

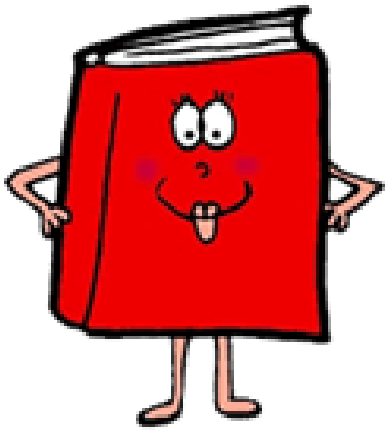
$5(-2)^2 - 3(3) - 5$

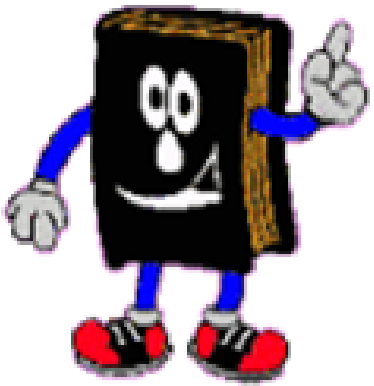
$20 - 9 - 5 = 6$

Slope-Intercept Form

What did one math book say to the other math book?

"I don't know about you man, but I got a lot of problems!"





Goals aligned to the Common Core Standards:

- You will create linear functions & inequalities from a sequence, table, or a given relationship.

- You will be able to describe key features of a linear function.

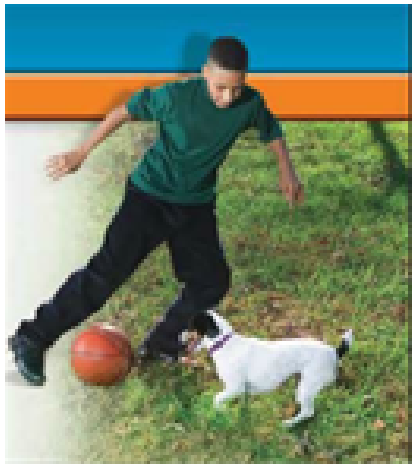
Why Linear equations?

Recycling one ton of waste paper saves an average of 17 trees, 7000 gallons of water, 3 barrels of oil, and about 3.3 cubic yards of landfill space.

The relationship between the amount of paper recycled and the number of trees saved can be expressed with the equation $y = 17x$, where y represents the number of trees and x represents the tons of paper recycled.

Why Linear Equations?

Joseph earns a monthly salary of $1200 and a commission of $125 for every car he sells. He needs to make $3500 each month to pay all of his bills. Why would a linear equation be useful in this situation?



Most humane societies have foster homes for newborn puppies, kittens, and injured or ill animals. During the spring and summer, a large shelter can place 3000 animals in homes each month.

If a shelter had 200 animals in foster homes at the beginning of spring, the number of animals in foster homes at the end of the summer could be represented by $y = 3000x + 200$, where x is the number of months and y is the number of animals.

What is slope-intercept form?

$$y = mx + b$$

m = slope

(0, b) = y-intercept (point where line crosses y-axis)

Find the slope and y-intercept in the following equations.

$y = 1/2x + 7$

m

b

$y = -2x - 5$

m

b

$y = 7 + 3x$

b

m

Write an equation in slope-intercept form for the line with the given slope and y-intercept.

x y

m = 1/4 point: (0 , 3)

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

m = −3 point: (0 , 2/3)

$y = mx + b$

$y = -3x + \frac{2}{3}$

Write the equation of the line when given...

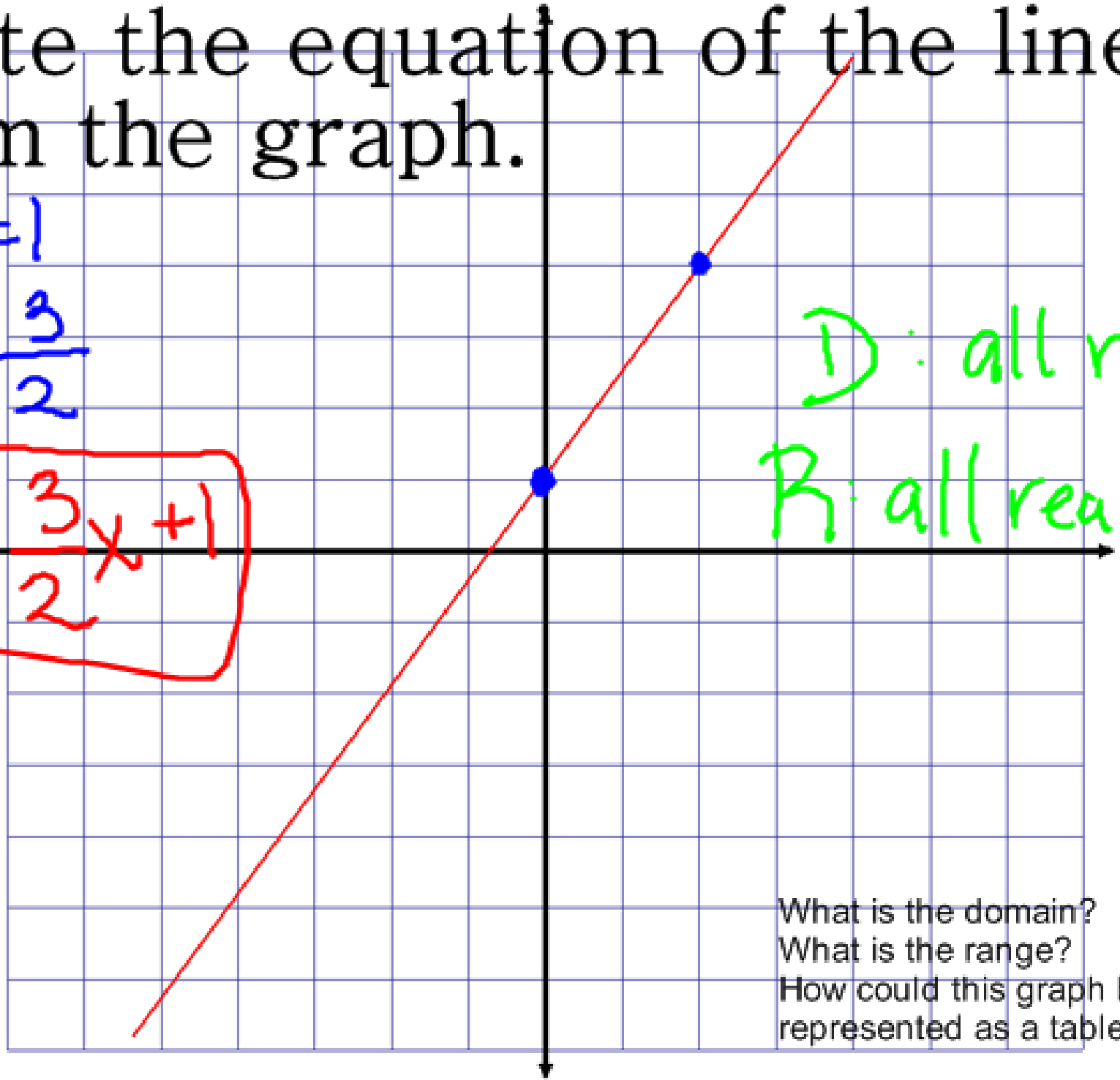
a zero slope and a y-intercept of 6

$y = 0x + 6$ $y = 6$

an undefined slope and a x-intercept of 5

$x = 5$

Write the equation of the line from the graph.



$b = 1$

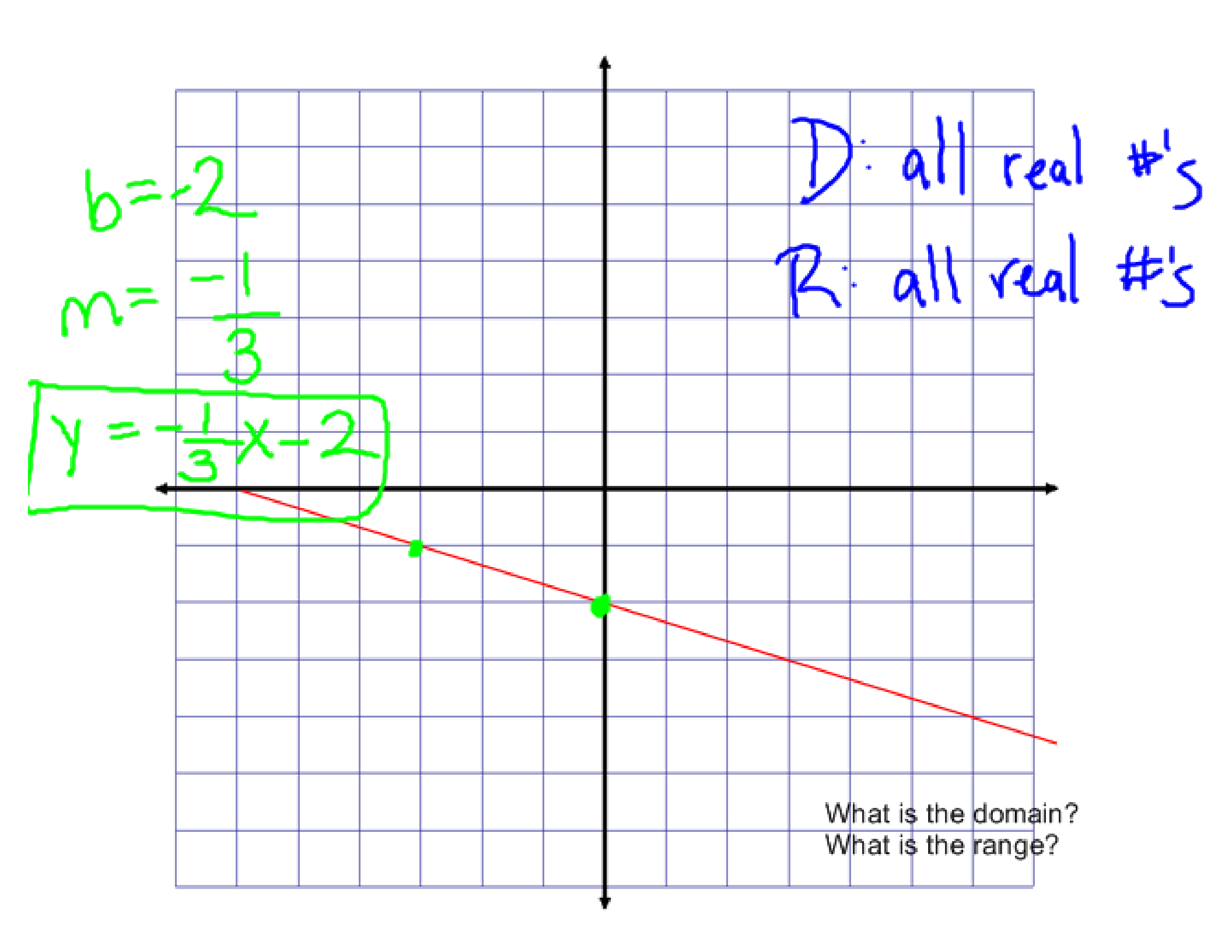
$m = \frac{3}{2}$

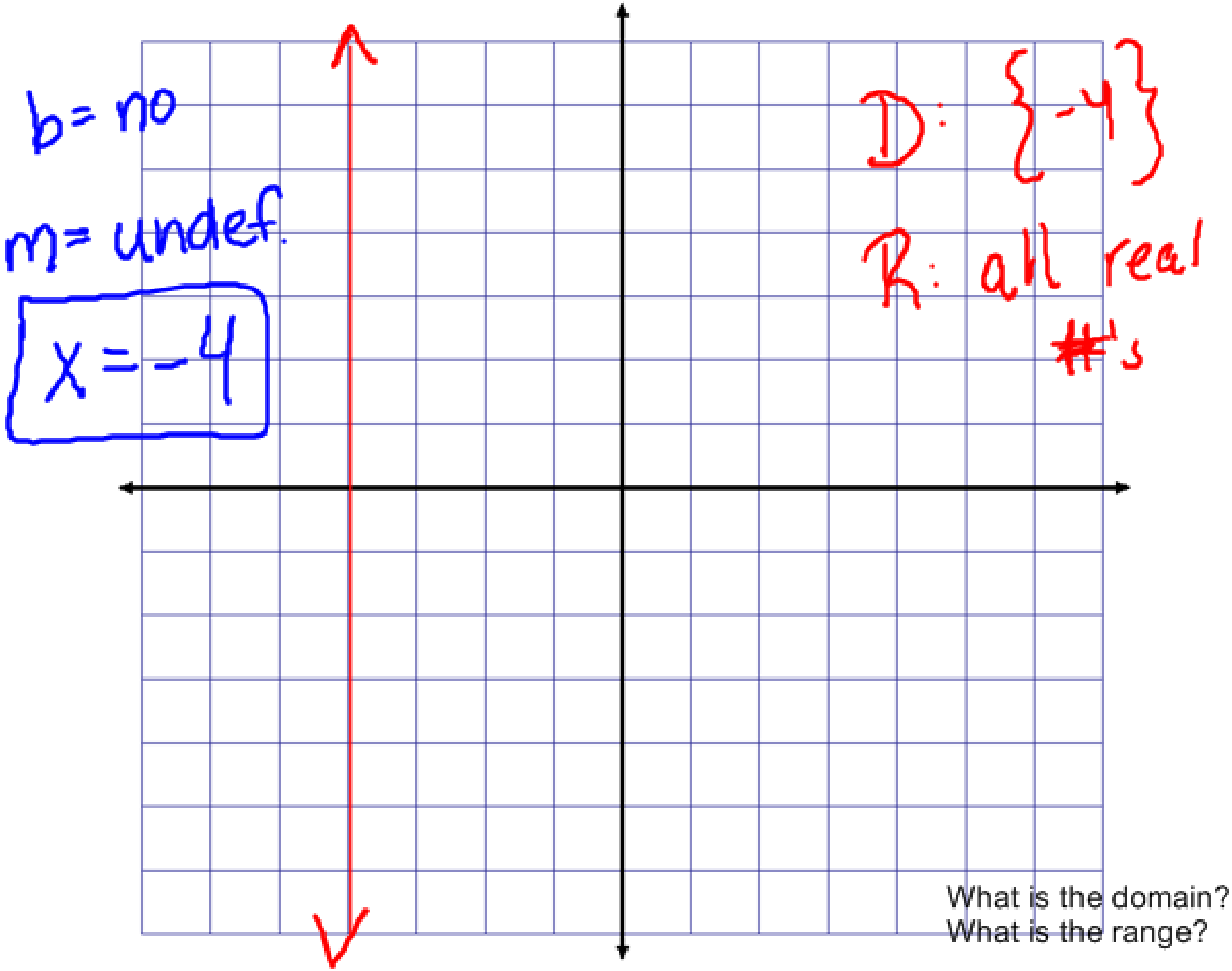
$y = \frac{3}{2}x + 1$

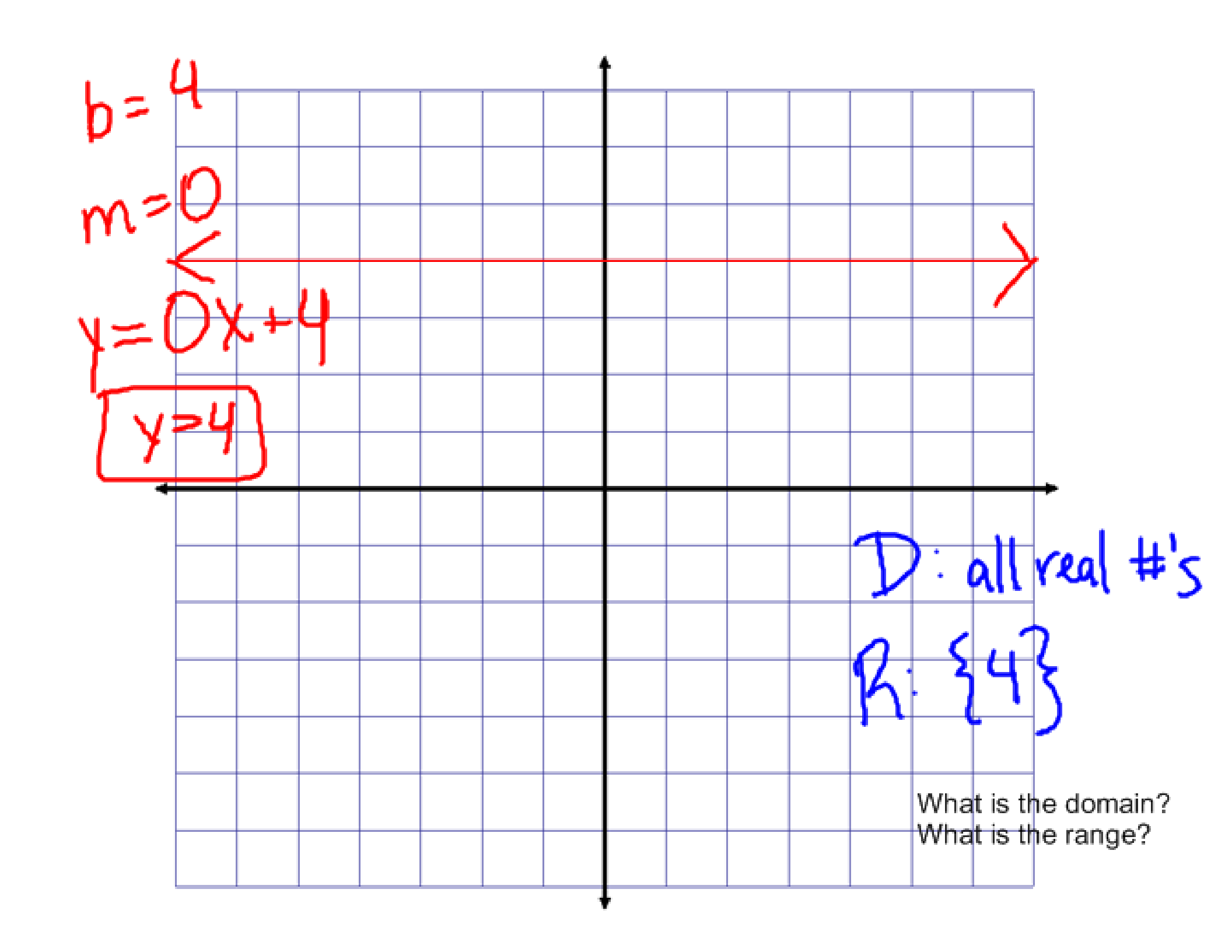
D: all real #s

R: all real #s

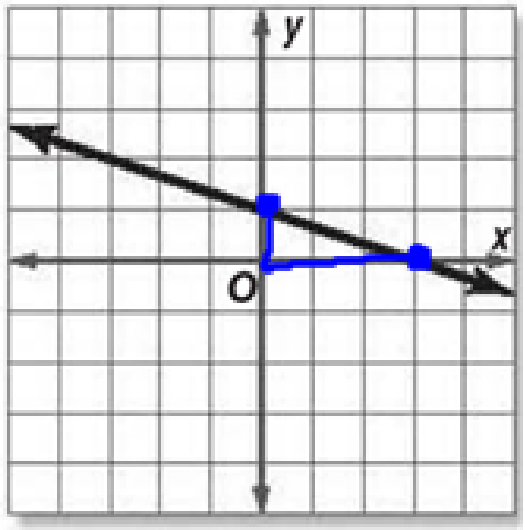
What is the domain?
What is the range?
How could this graph be represented as a table?


b = -2
m = -1/3
y = -1/3 x - 2
D: all real #'s
R: all real #'s
What is the domain?
What is the range?


b= no
m= undef.
x = -4
D: {-4}
R: all real #'s
What is the domain?
What is the range?


b = 4
m = 0
y = 0x + 4
y = 4
D: all real #'s
R: {4}
What is the domain?
What is the range?

Which of the following is an equation in slope-intercept form for the line shown?



A $y = -3x + 1$

B $y = -3x + 3$

C $y = -\frac{1}{3}x + 1$

D $y = -\frac{1}{3}x + 3$

$m = -\frac{1}{3}$

$b = 1$

Using the slope-intercept form, how would you graph the line?

$m = \frac{1}{2}$ $b = 3$

$y = 1/2x + 3$

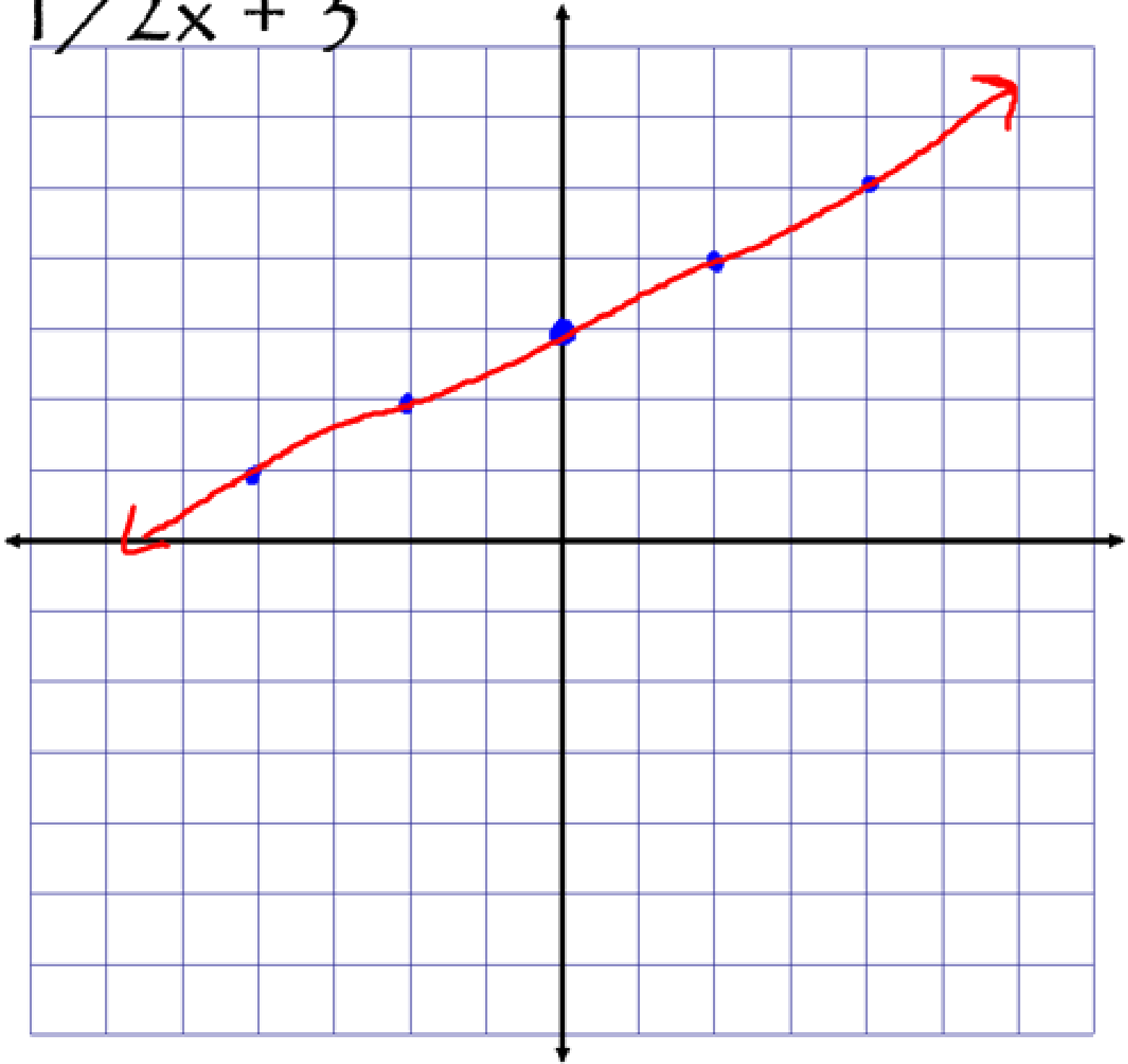
What about these?

$y = 2$ $x = -3$

Steps:

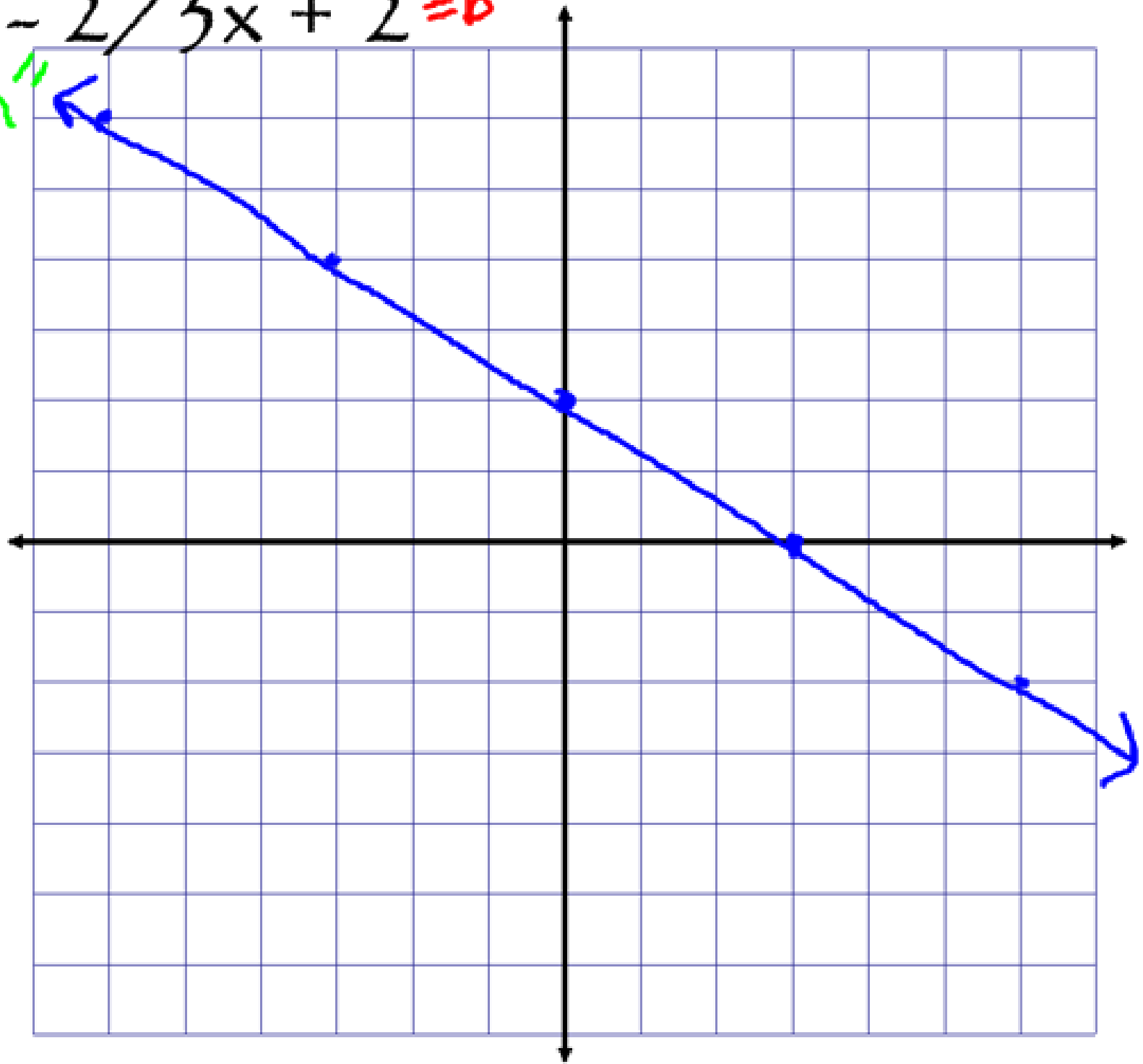
1. Make sure your equation is in slope-intercept form.
2. Plot your y-intercept on the y-axis.
3. From the y-intercept, use the slope to plot at least 2 additional points.
4. Draw a line through the points.

$y = 1/2x + 3$

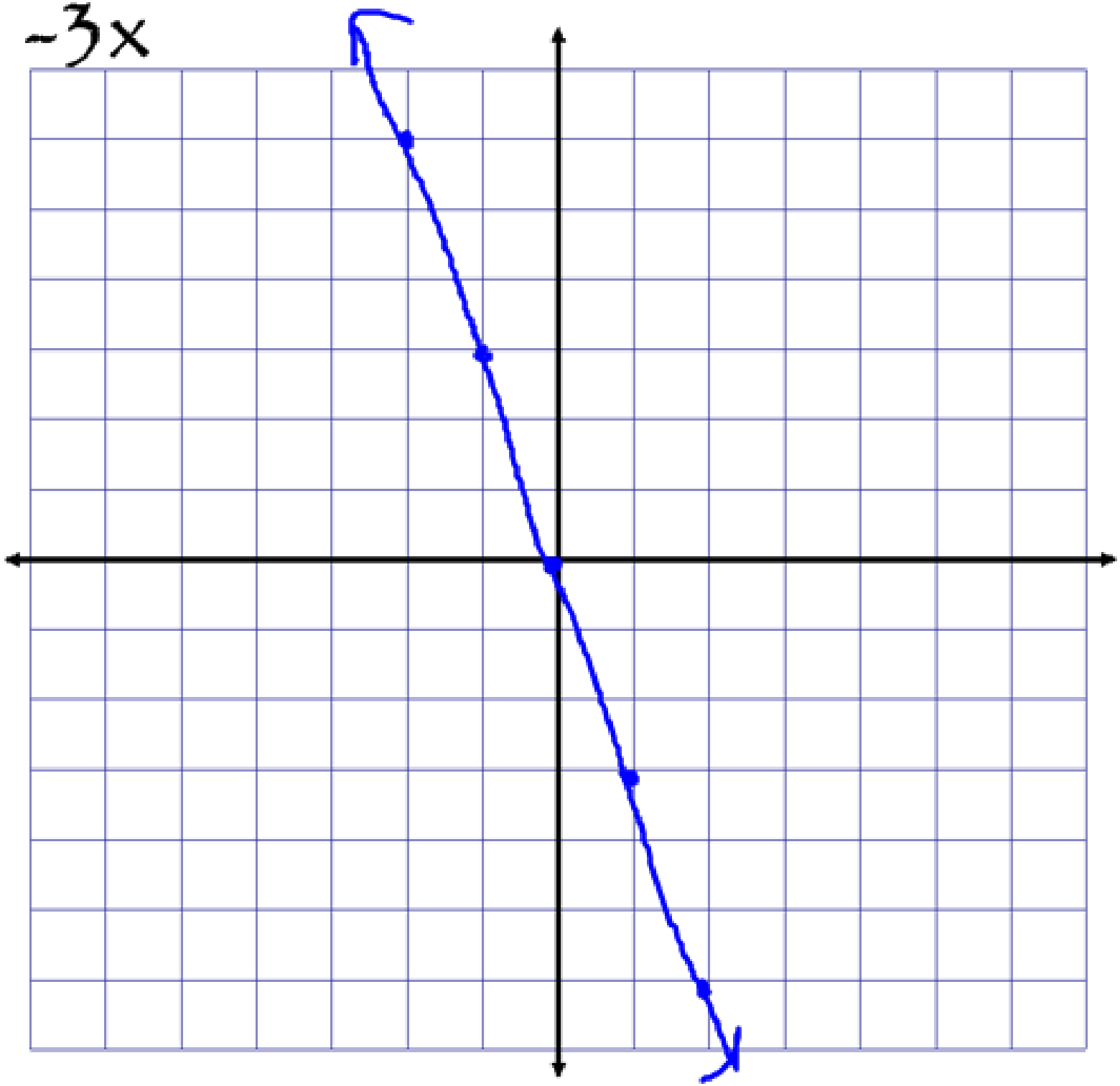


$y = -2/3x + 2$ =b

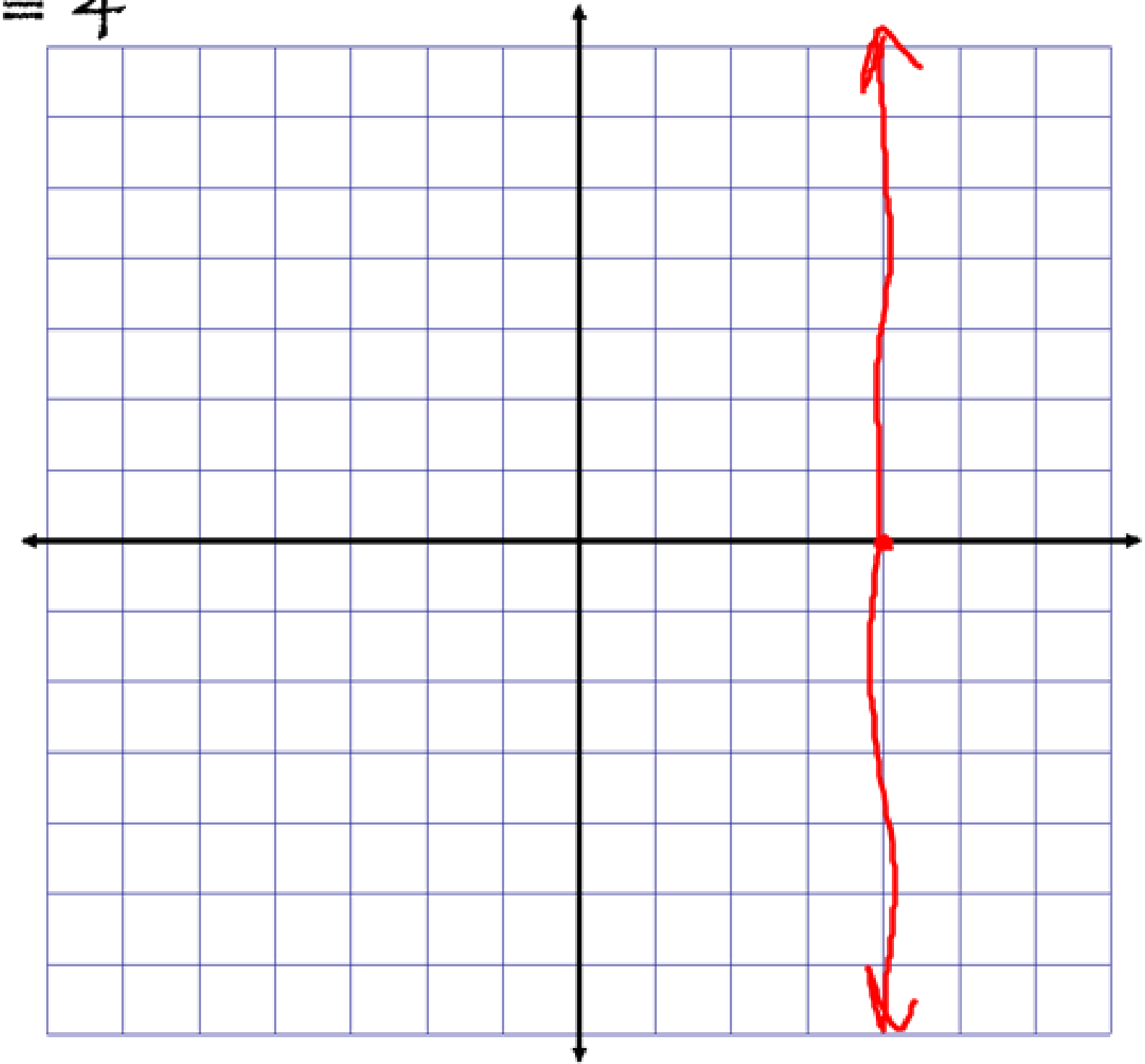
m

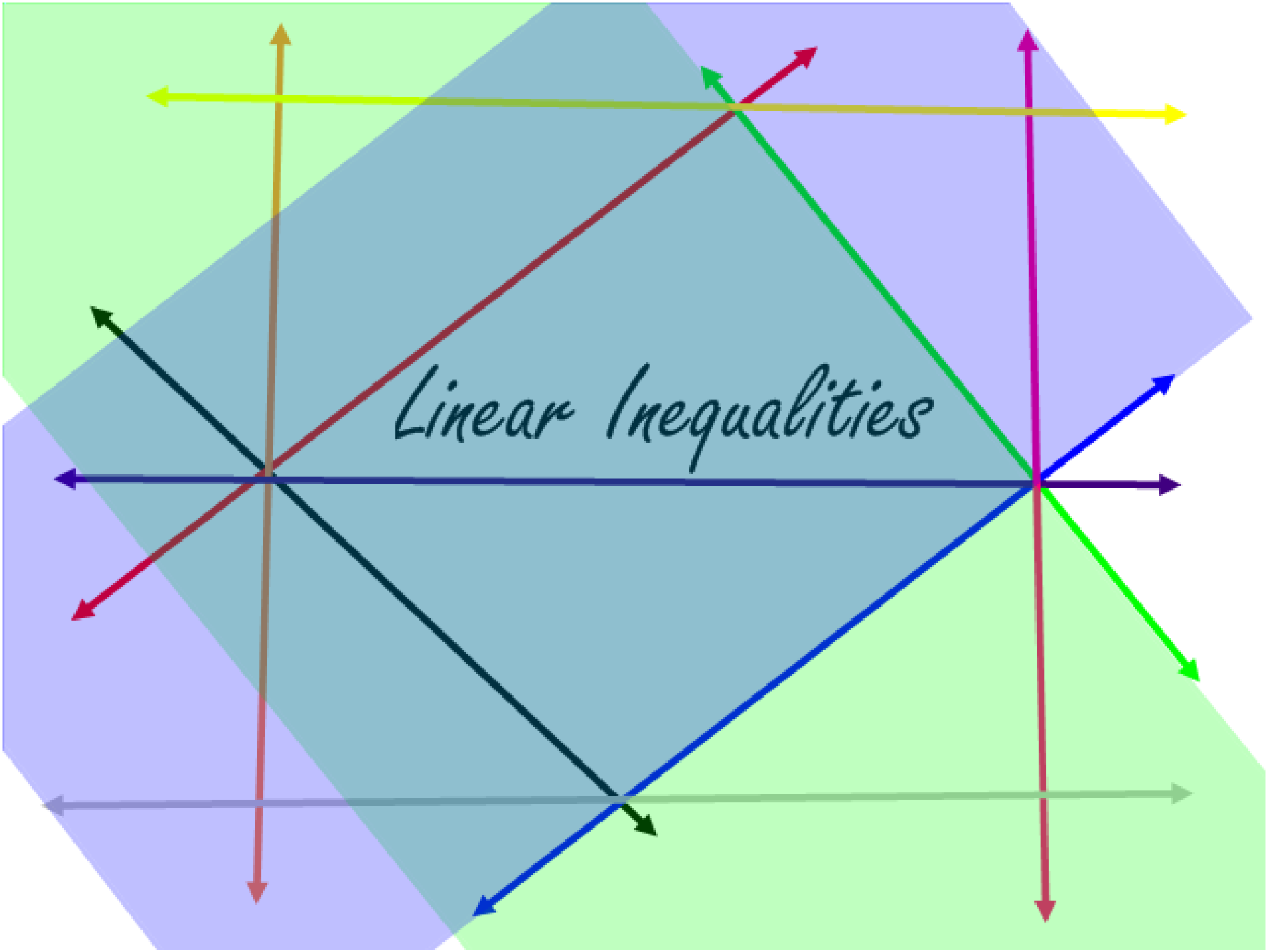


$y = -3x$



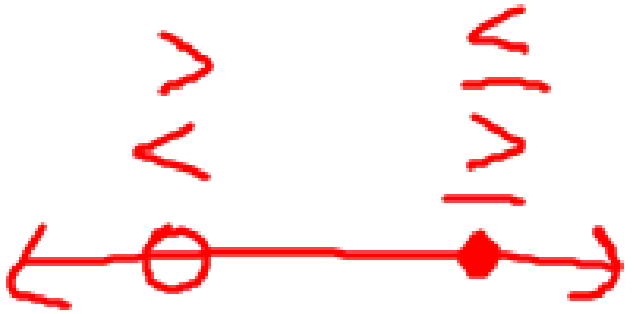
$x = 4$




Linear Inequalities

Steps for Graphing Inequalities

in slope-intecept form



Rules for the :Line

> or < : Dashed Line

≥ or ≤ : Solid Line

Rules for the : Shading

> or ≥ : Shade greater than the line

< or ≤ : Shade less than the line

$$y \leq -\frac{1}{5}x + 4$$

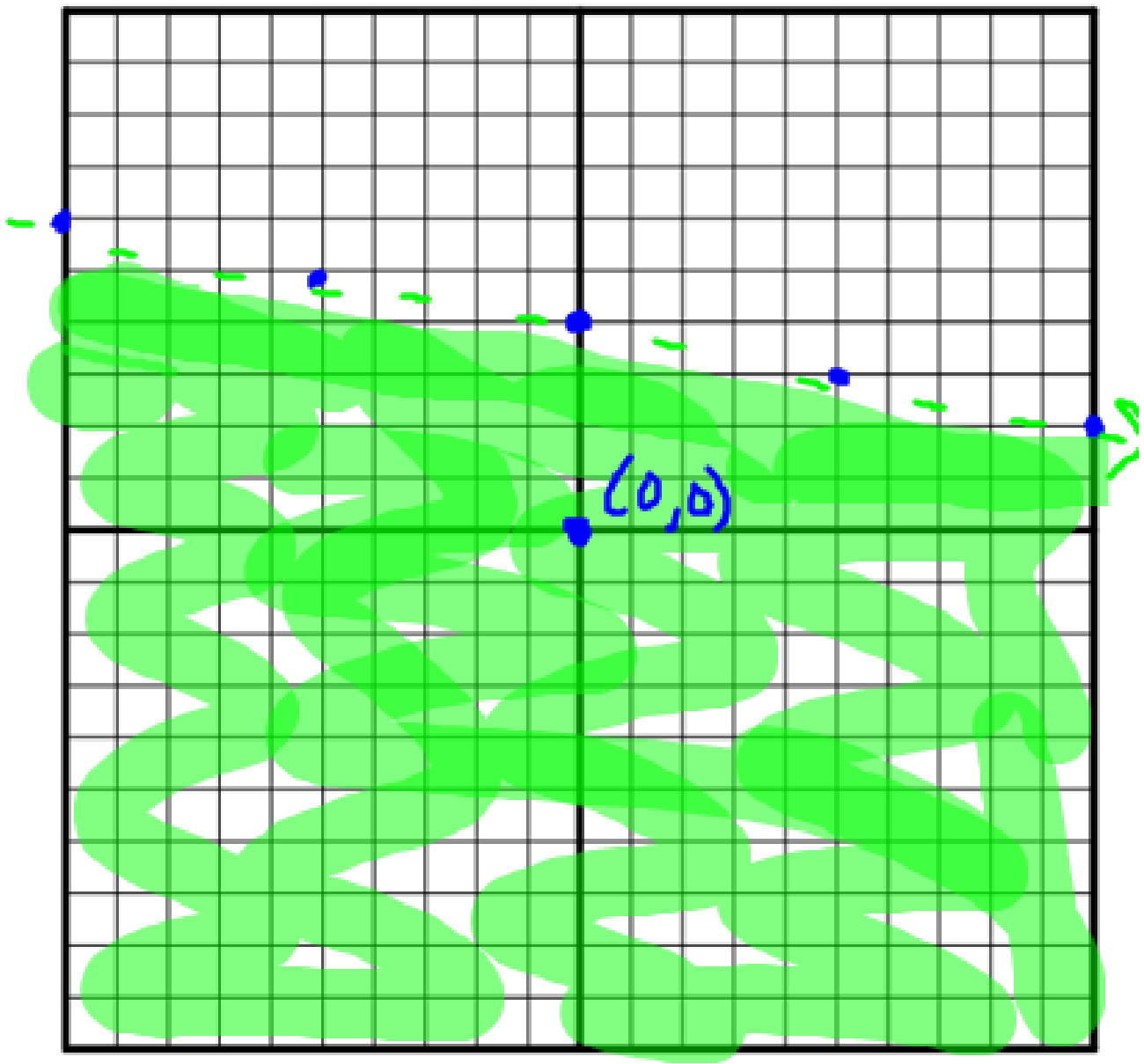
Lets Practice

$m = -\frac{1}{5}$

$b = 4$

$0 < -\frac{1}{5}(0) + 4$

$0 < 4$

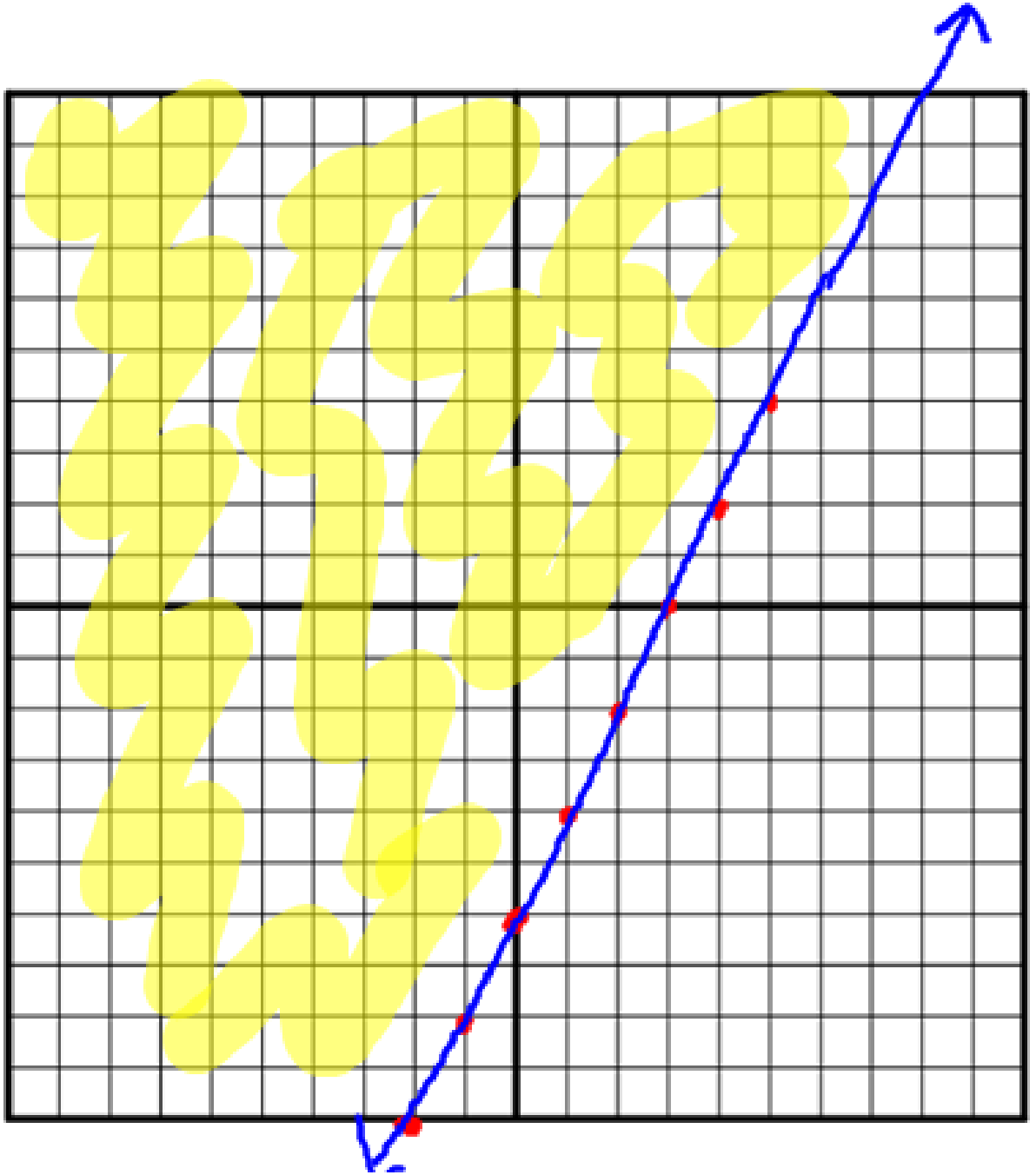


$y \geq 2x - 6$

Lets Practice

m=2

b=-6



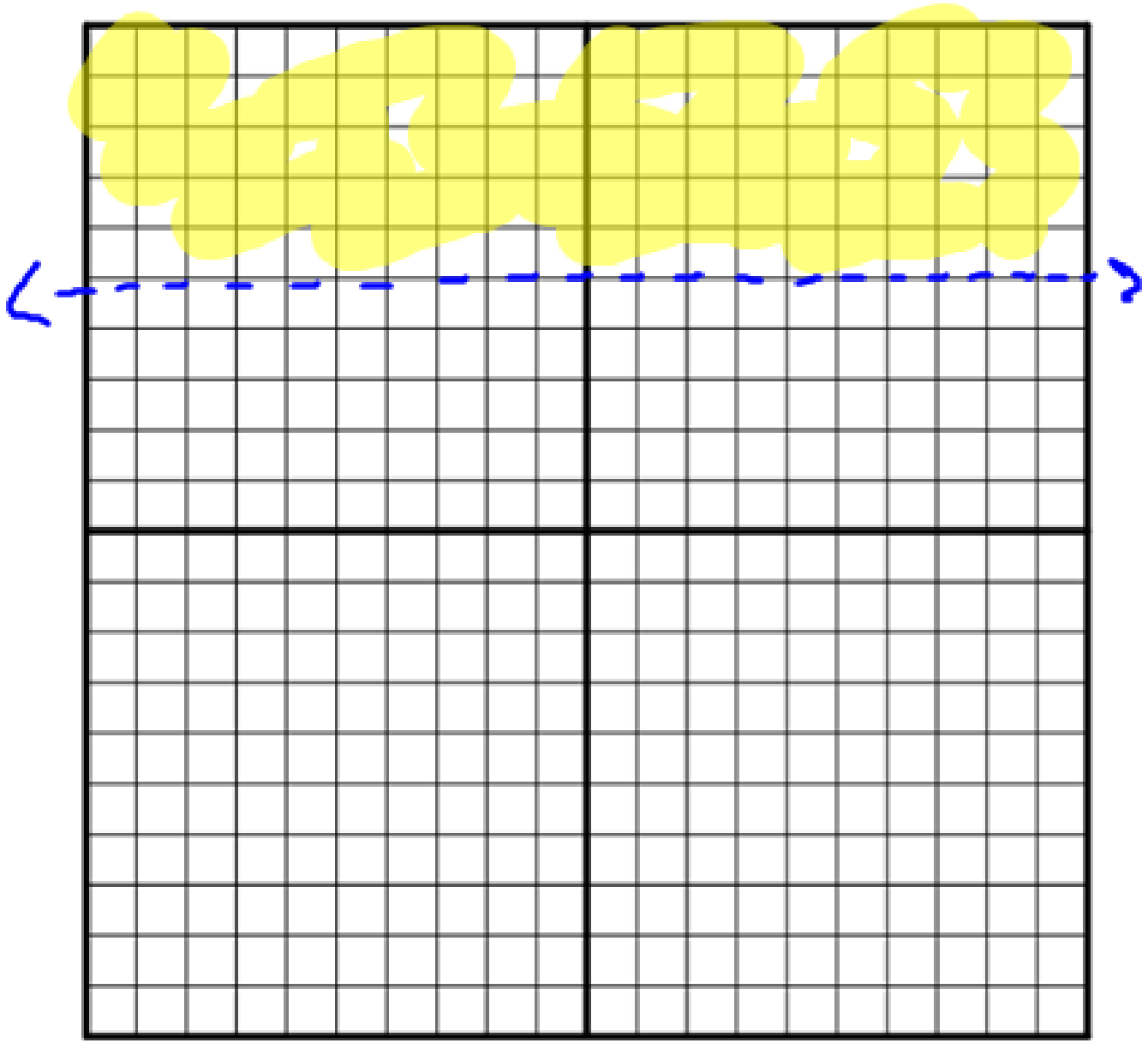
Special Lines

Tell me about this line:

Tell me about this line:

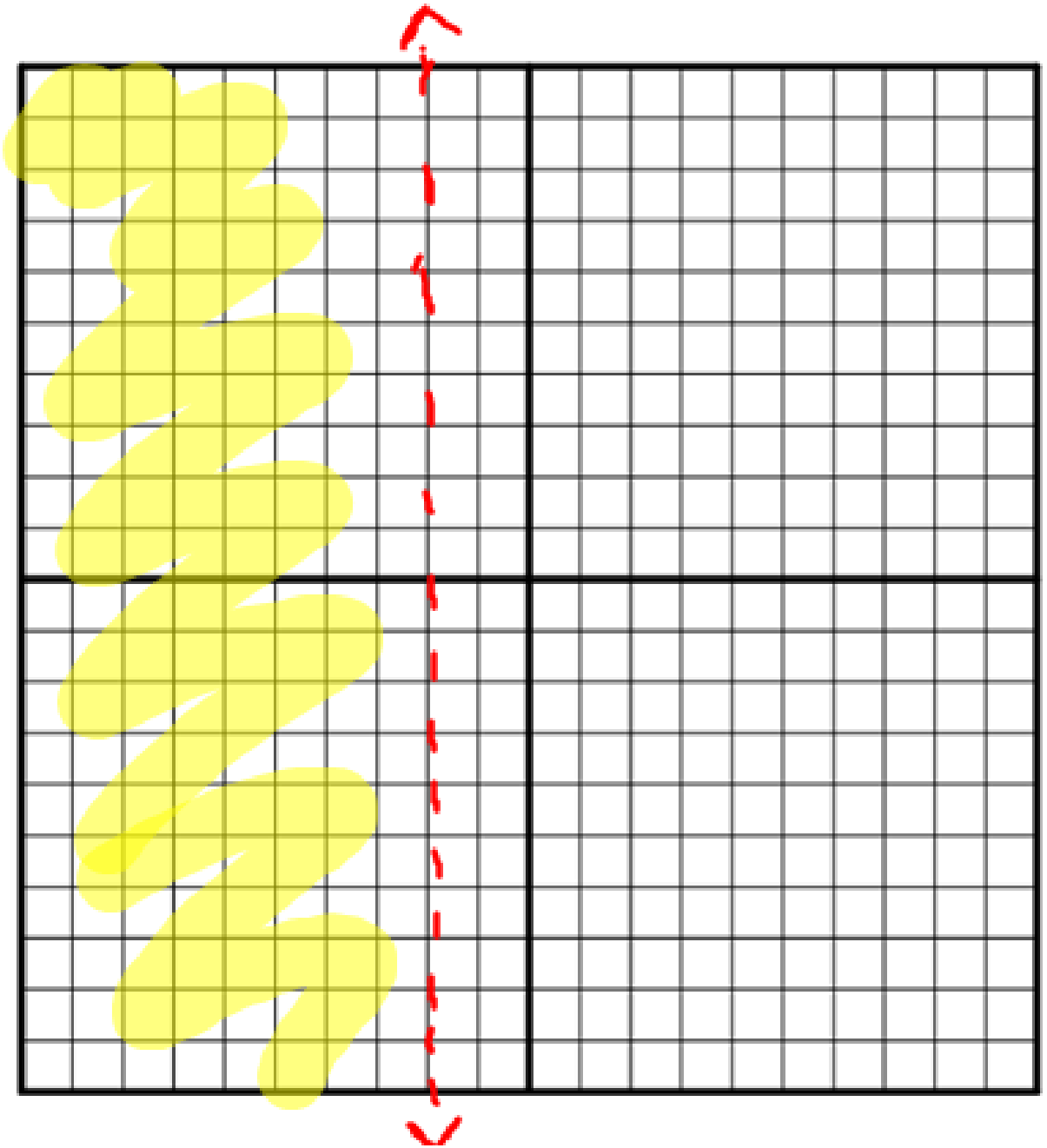
$y > 5$

Lets Practice



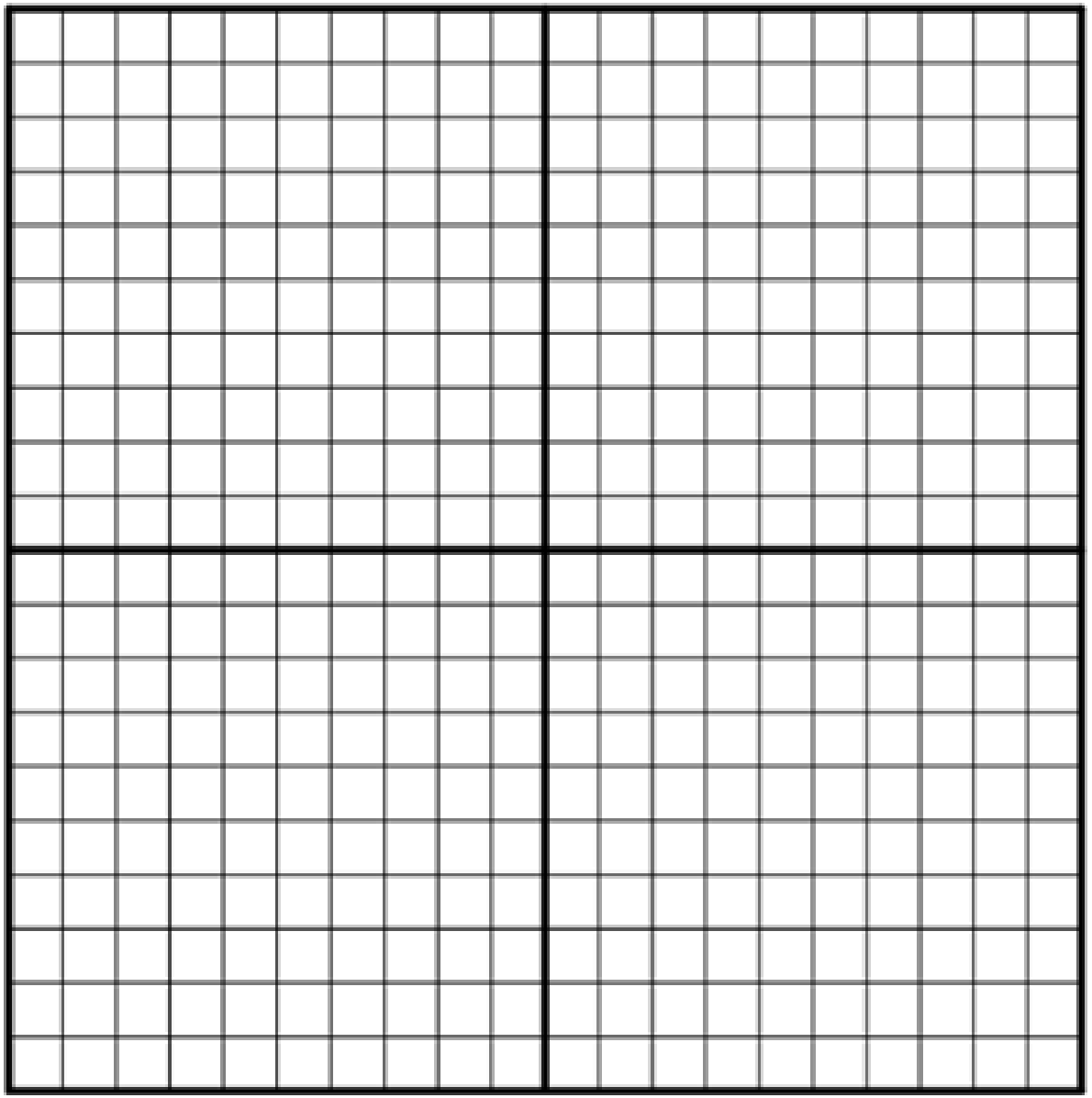
$x < -2$

Lets Practice



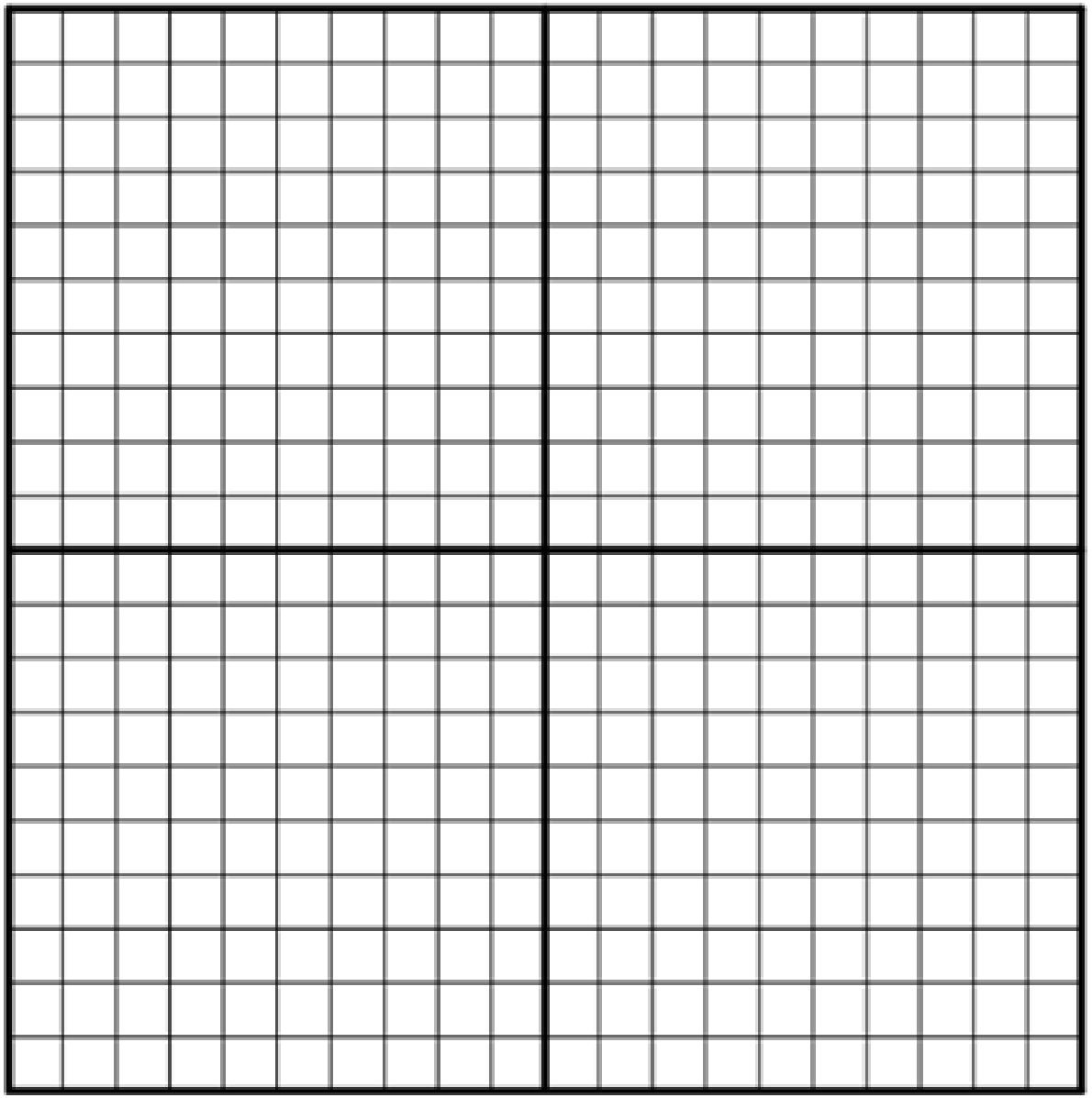
$y \leq 4$

Lets Practice



$x \geq 3$

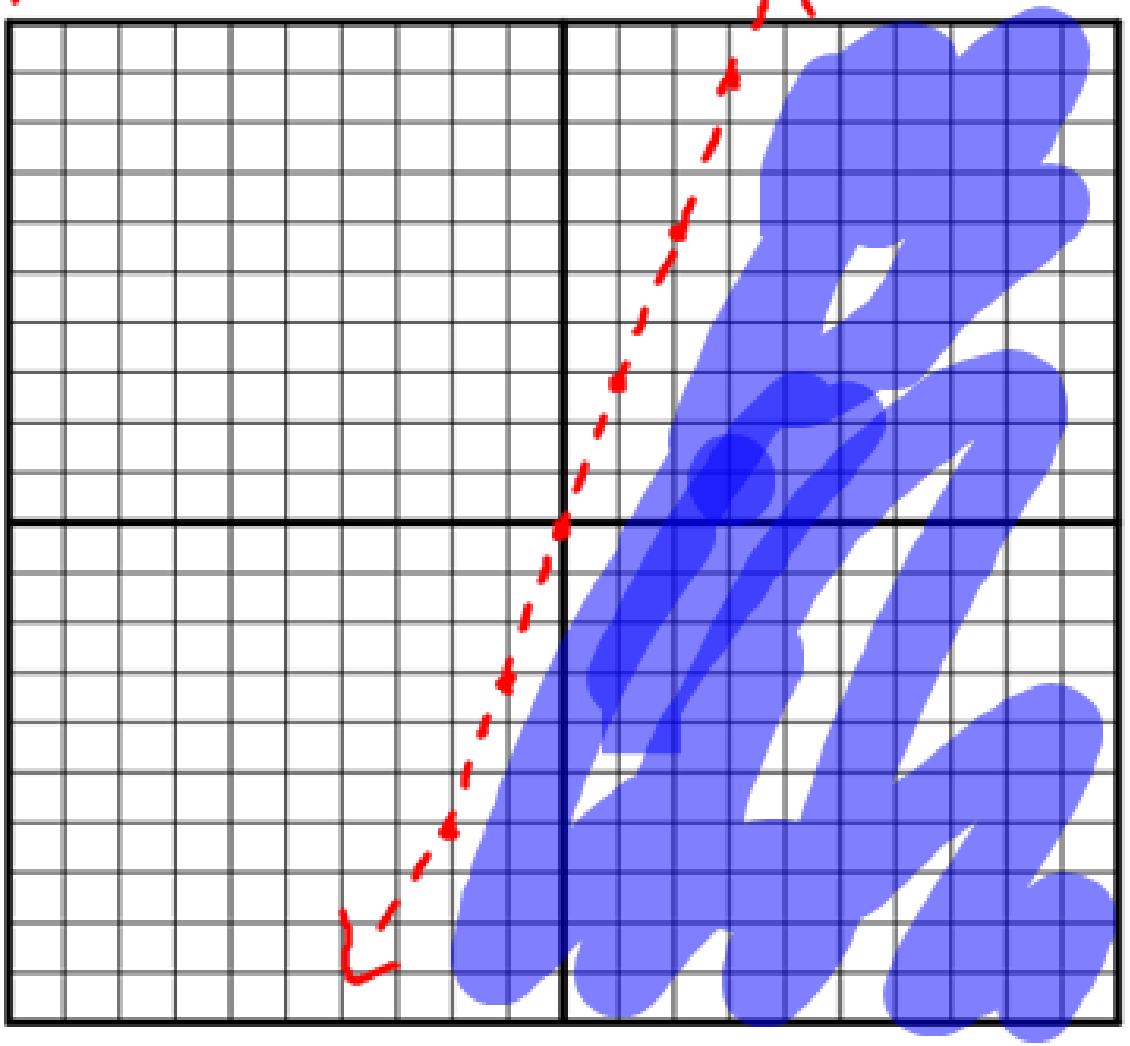
Lets Practice



Determine which ordered pairs are part of the solution set for each inequality.

$y < 3x$ $3(3) = 9$

$\{(-3,1), (-3,2), (1,1), (1,2)\}$



What is the equation of the line in slope-intercept form?

X	2	4	6	8	10
Y	-1	2	5	8	11

2

3

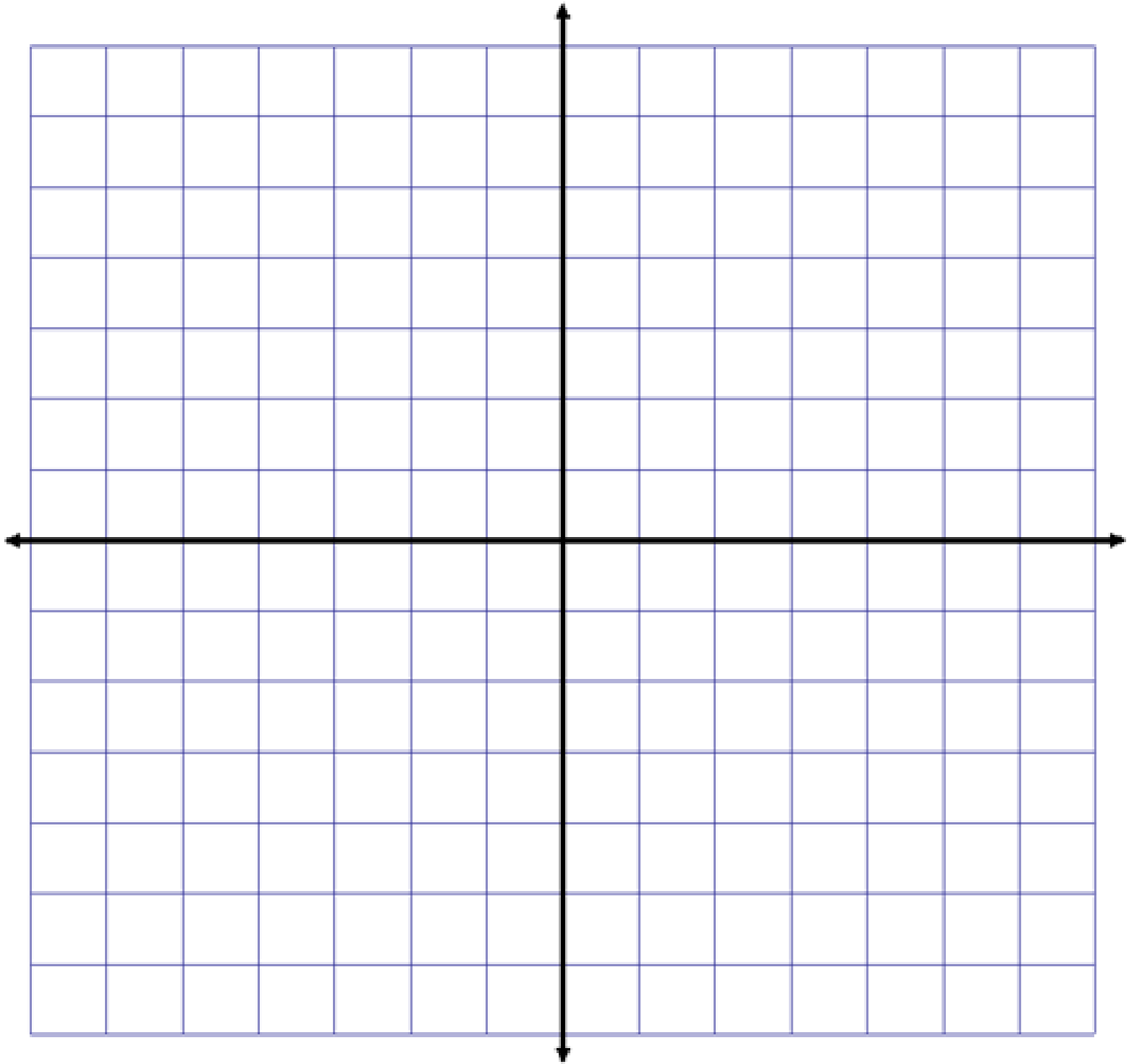
Graph it.

Describe it.

$m = \frac{3}{2}$

$-4 = b$

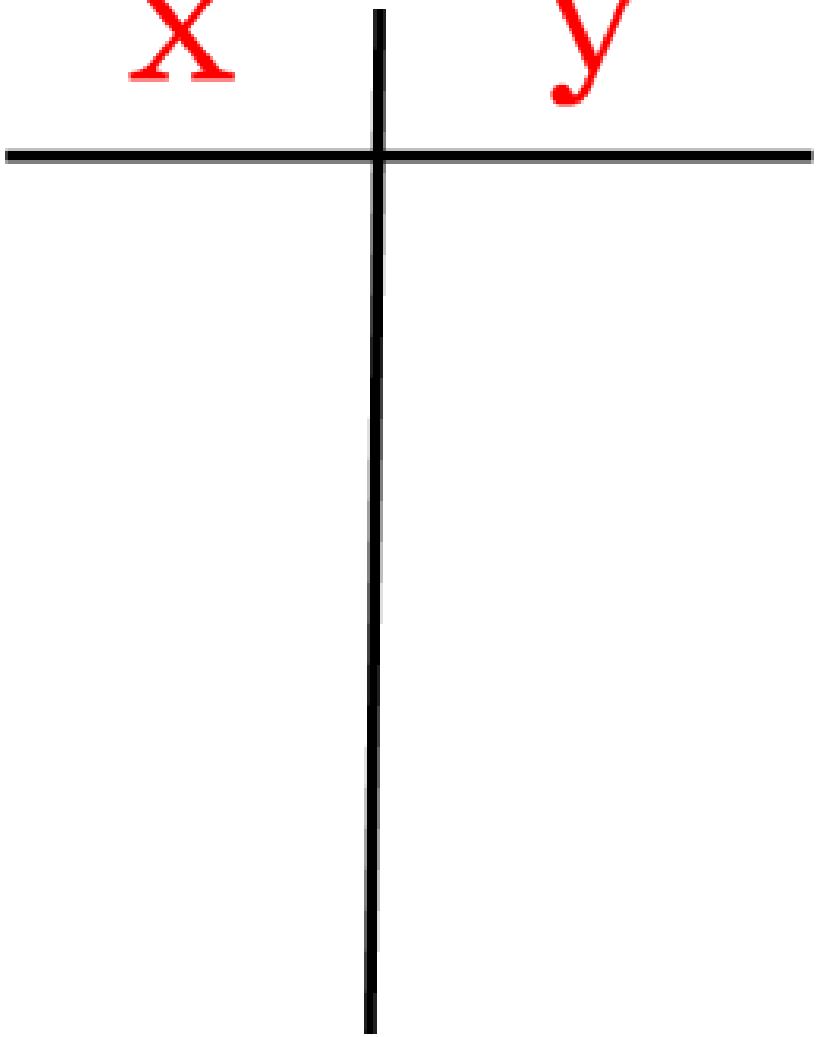
$y = \frac{3}{2}x - 4$

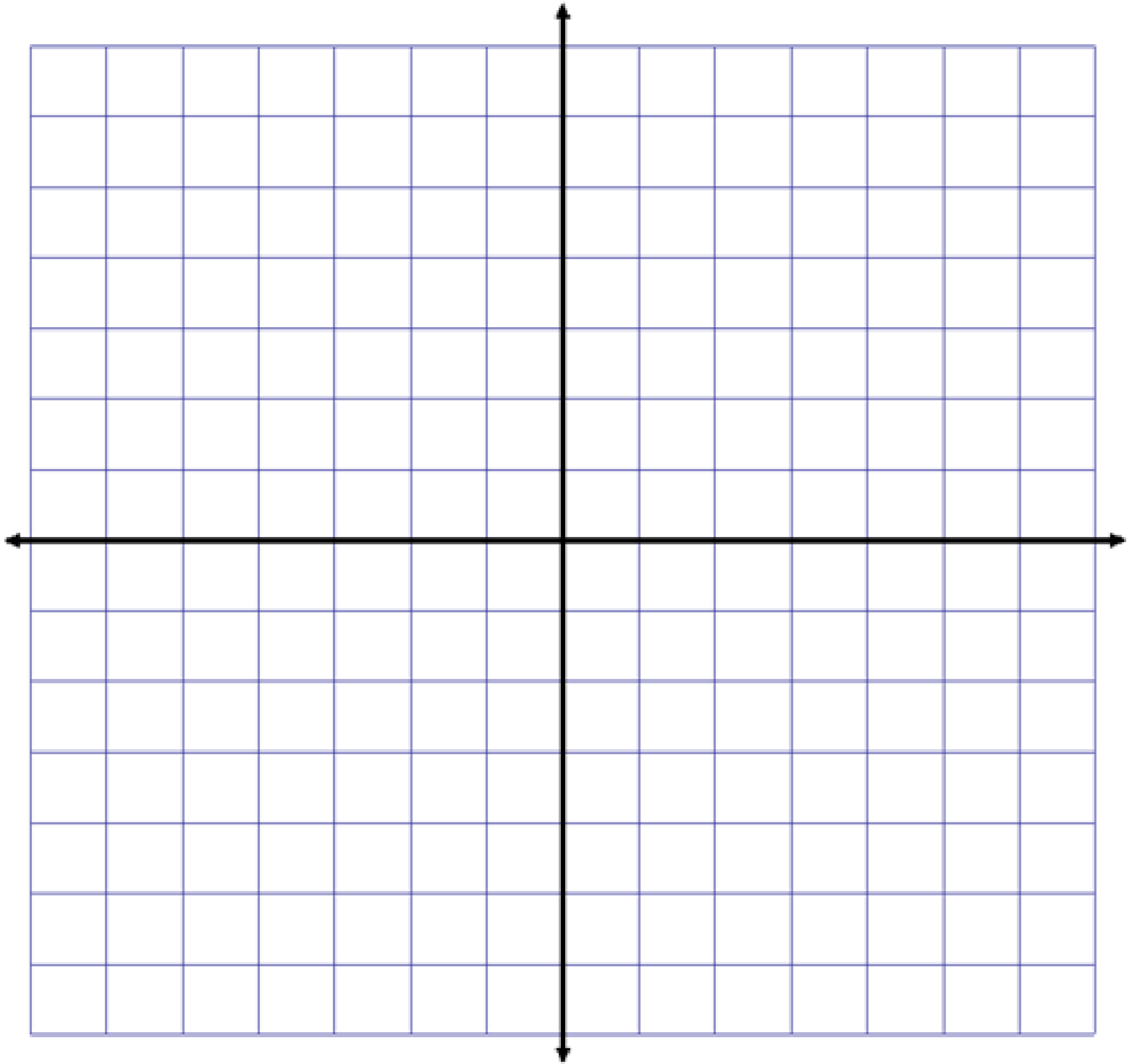


Graph by table:

$3y + 2x = 3$

x	y





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Graphing in Slope-Intercept Form Wkst

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