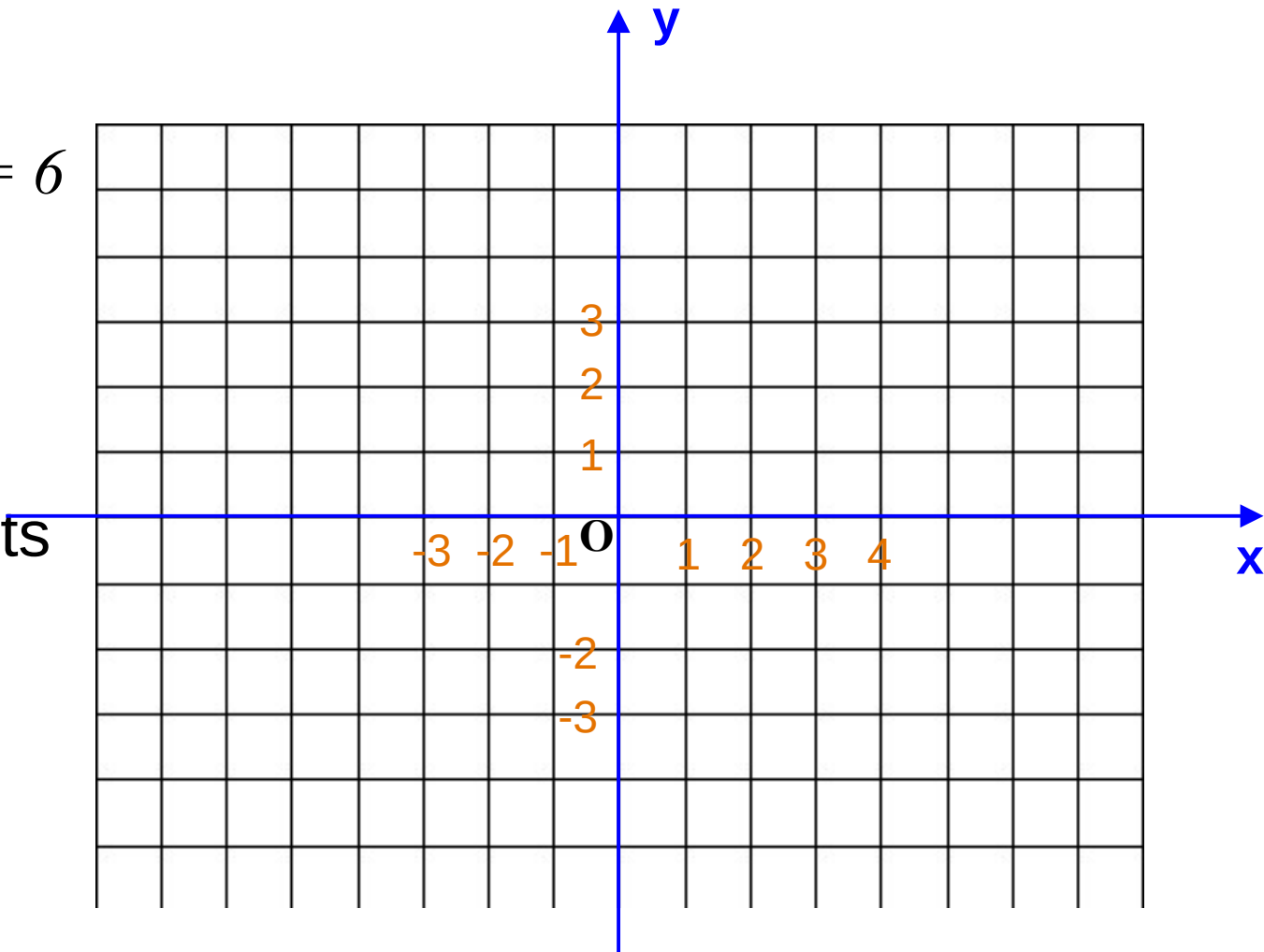# Graphing linear functions

Exercise 1:

Let's graph $2x - 3y = 6$ by using

1) any three points

2) x- and y-intercepts

3) the slope

Graphing linear functions

Exercise 2:
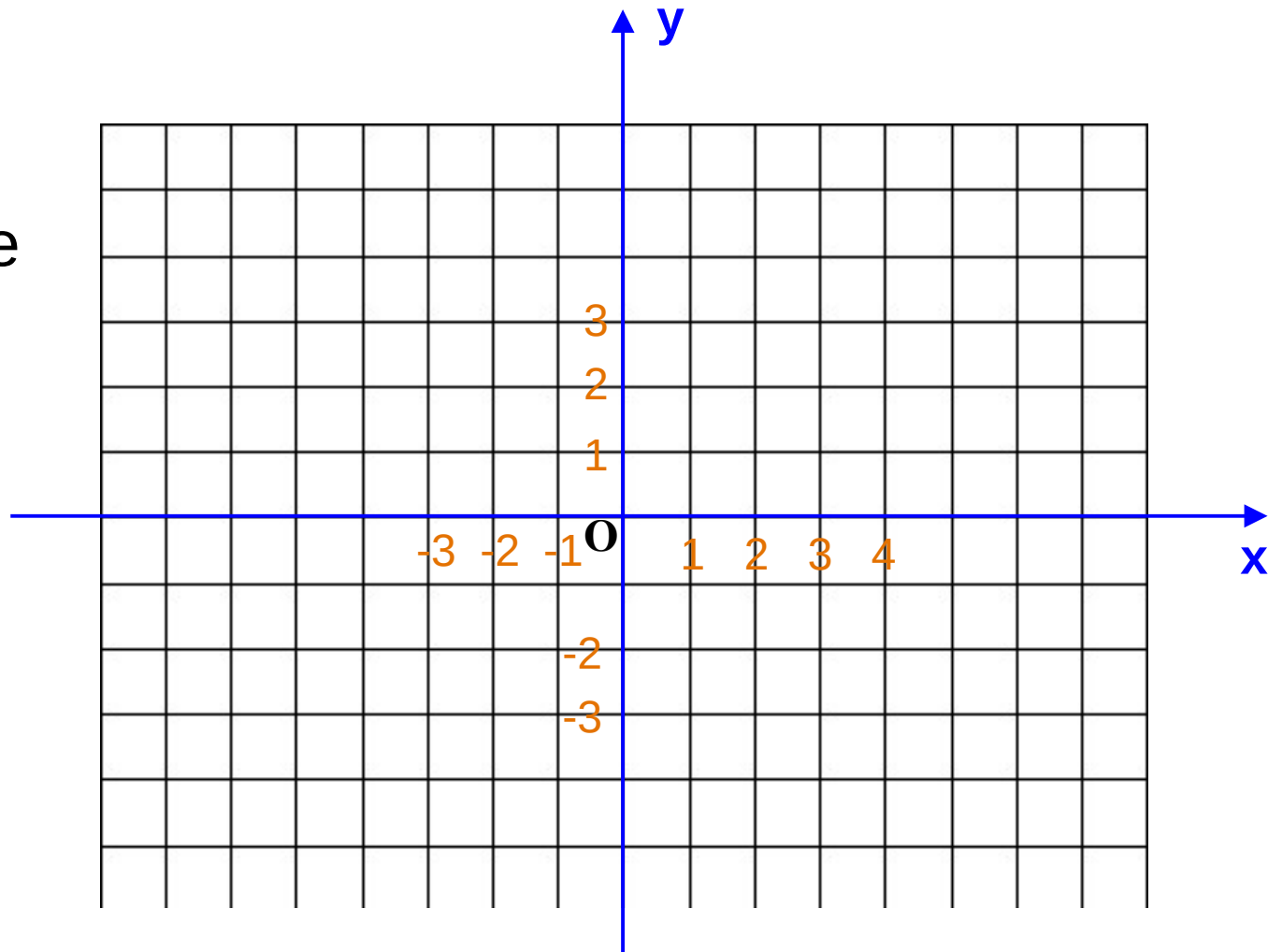Let's graph using Transformations the following functions

$f(x) = x$
$g(x) = 0.5x$
$h(x) = 0.5x + 2$
$k(x) = 0.5(x+1)$
$t(x) = 0.5(x+1) - 4$

Graphing linear functions

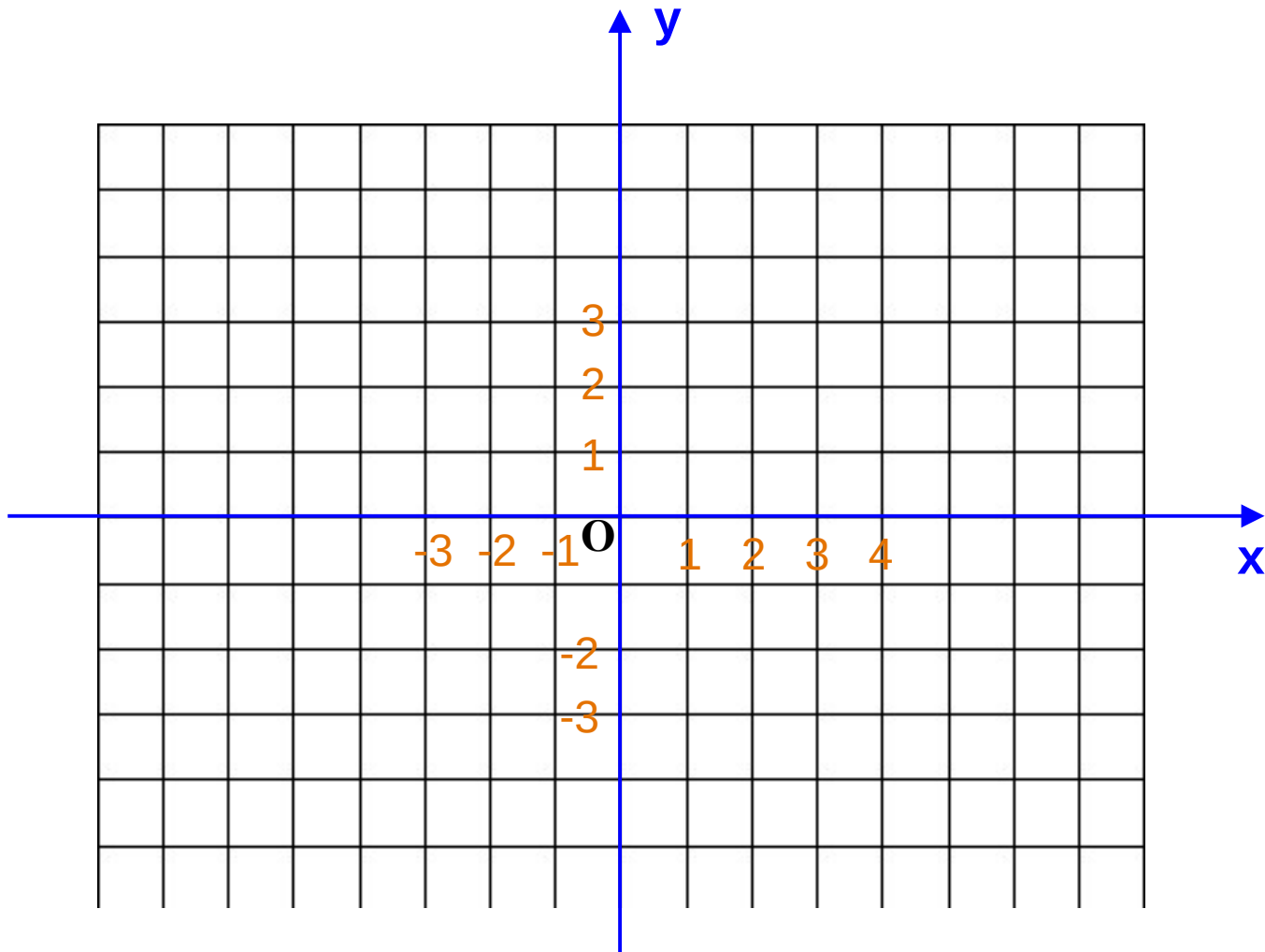Exercise 3:
Let's graph the following functions

$f(x) = 5$ or $y = 5$

and

$x = -3$

Slope of the line

Summary:

"up the hill":
  m > 0
"down the hill":
  m < 0
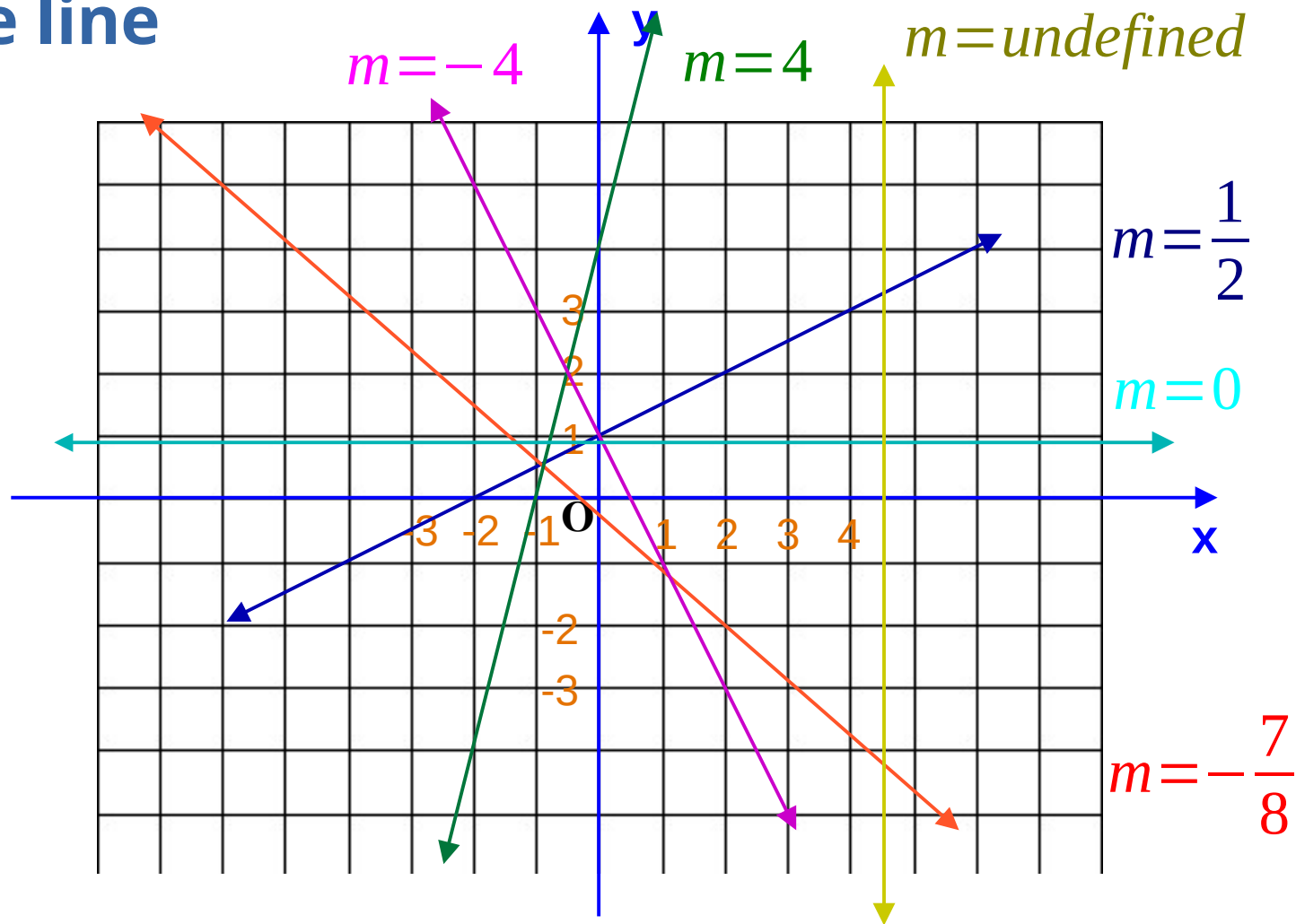horizontal line:
  m = 0
vertical line:
  m = undefined

$m=-4$ $m=4$ $m=undefined$

$m=\dfrac{1}{2}$

$m=0$

$m=-\dfrac{7}{8}$

In-class practice

Exercise 1: The horizontal line is passing through the point (-4,5). What is its equation in *slope-intercept form?*
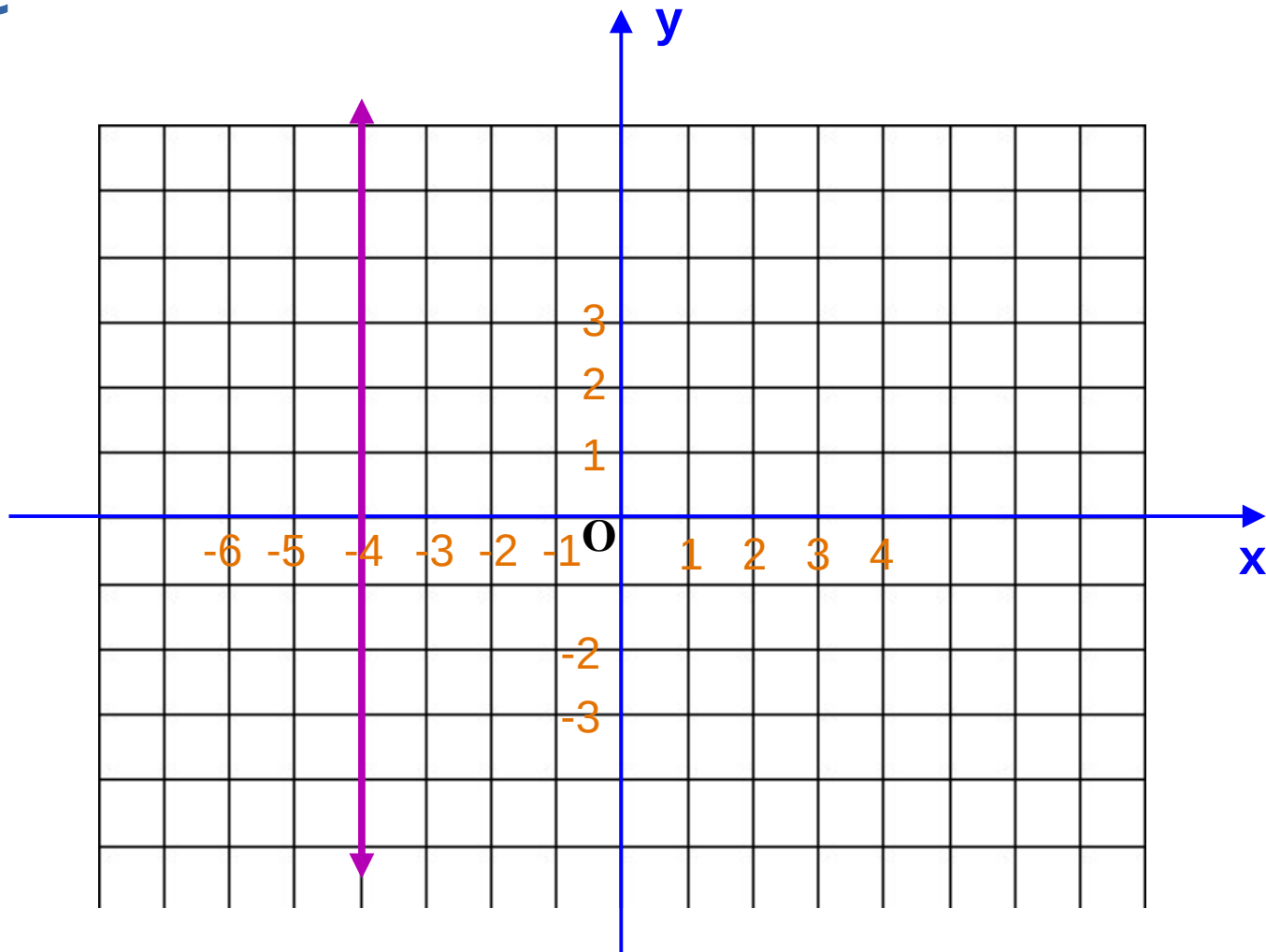
In-class practice

Exercise 2: What can you say about a line that passes through the points (-4,5) and (-4,3)?

In-class practice

Exercise 3: given the graph of a line
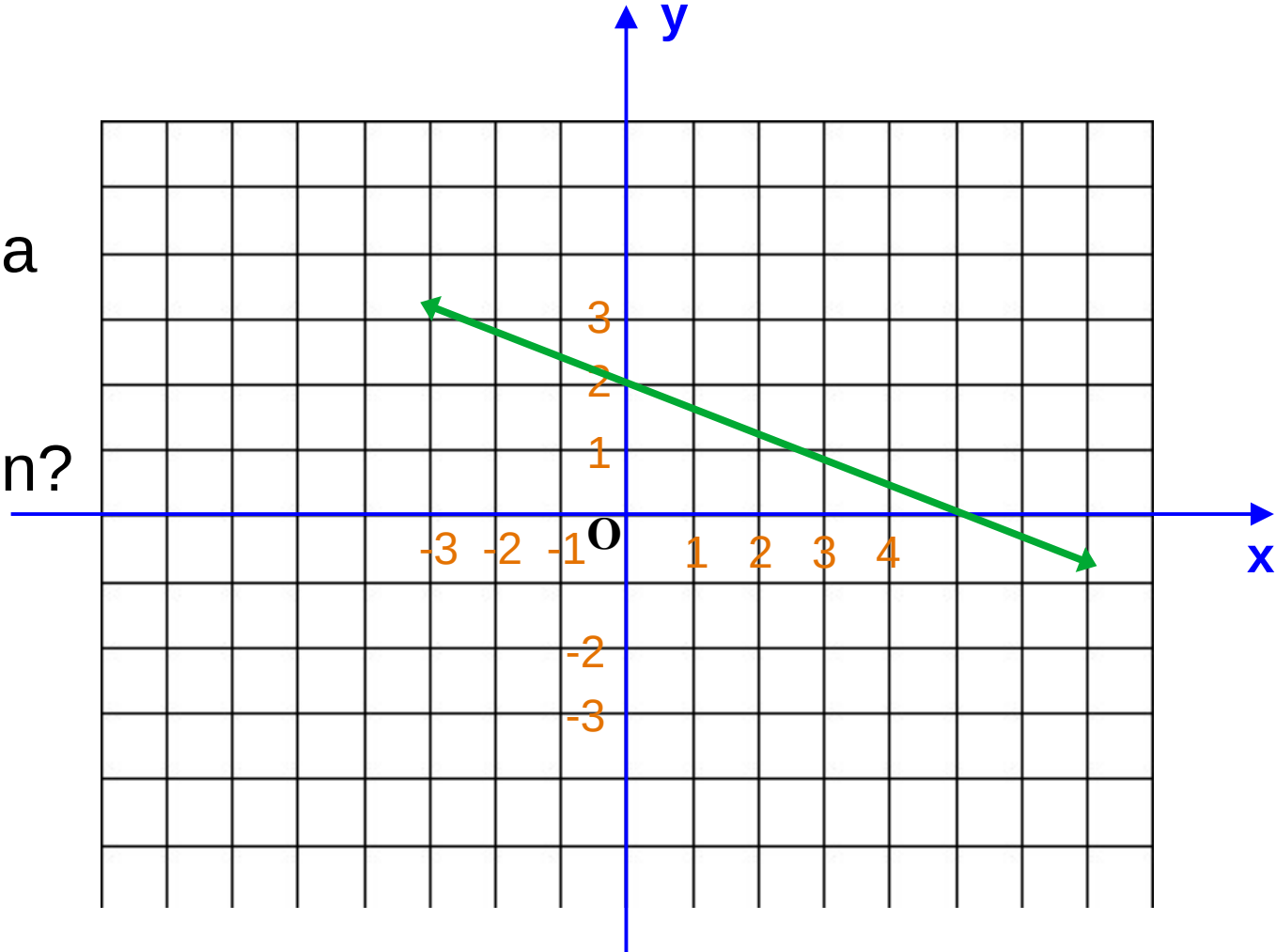
(a) give its equation

(b) does it represent a function?

Writing the Equation for a Function from the Graph of a Line

Exercise 4:
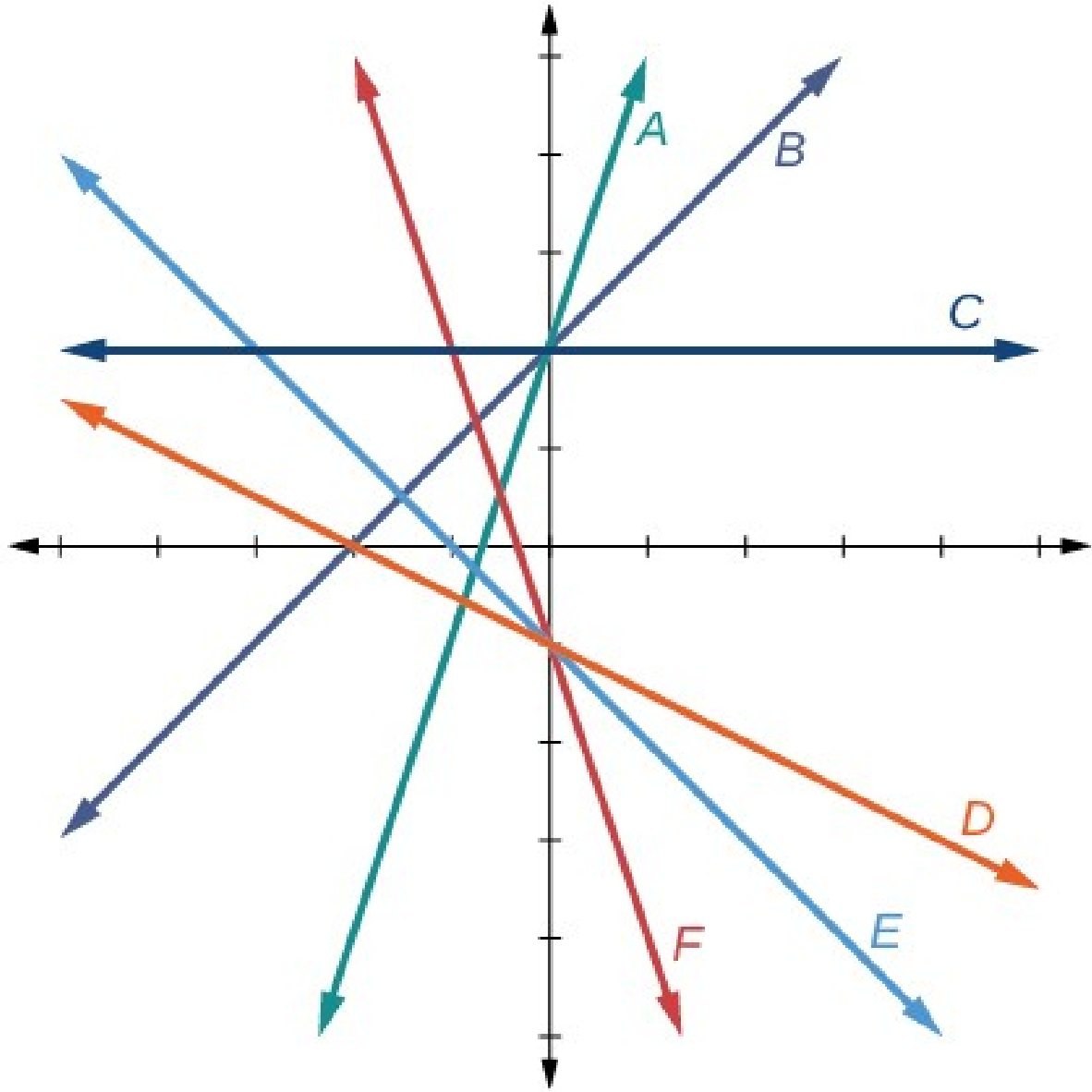Consider the graph of a linear function:

Can we get its equation?

Exercise 5:
Let's match the graph to its equation!

$f(x) = -x - 1$

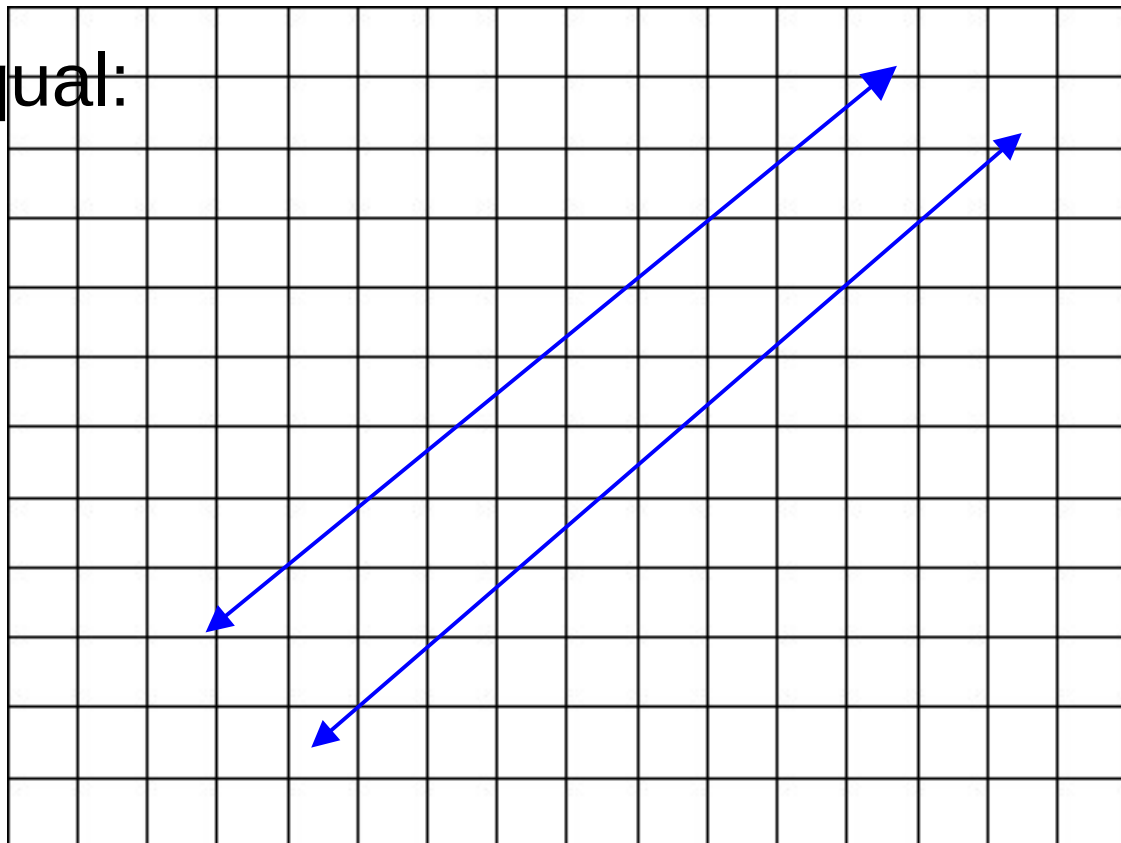$g(x) = -\dfrac{1}{2}x - 1$

$t(x) = 3x + 2$

Parallel and perpendicular lines

Two lines can be parallel to each other:
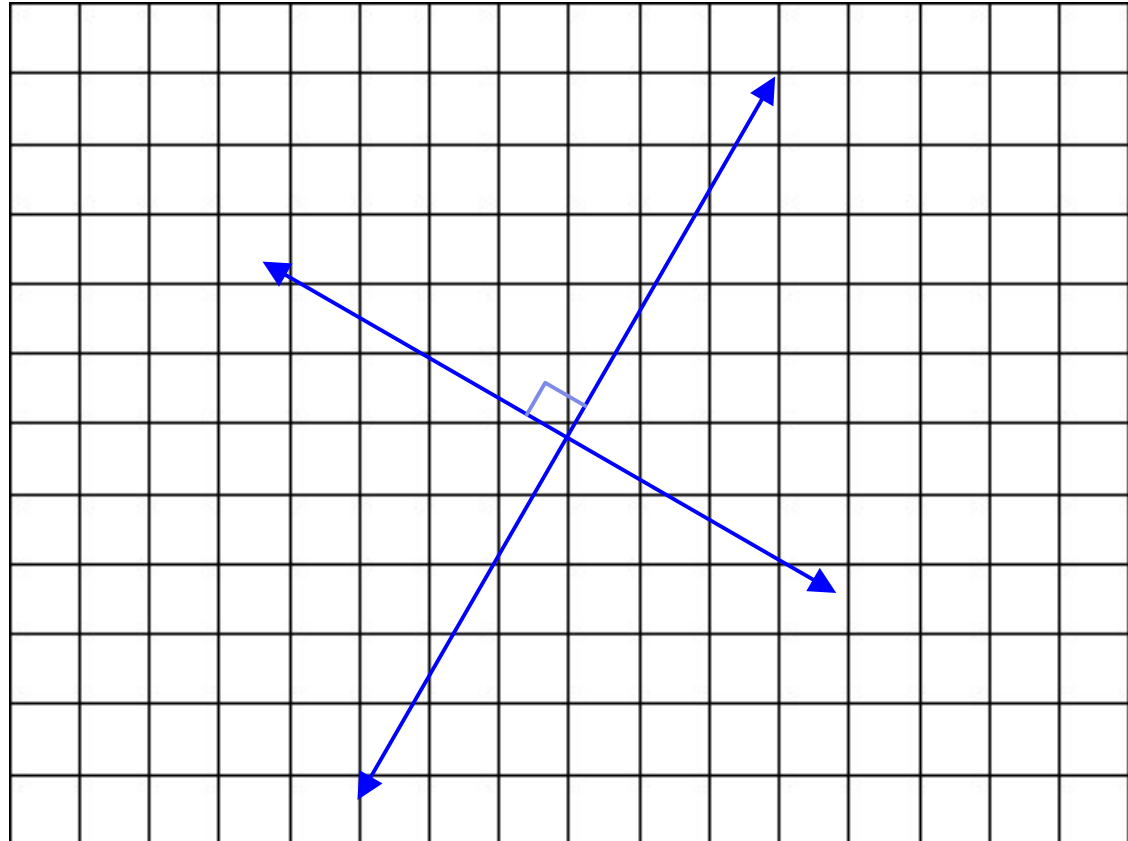
then their slopes are equal:

$$m_1 = m_2$$

Parallel and perpendicular lines

Two lines can be perpendicular to each other:

then their slopes are *negative reciprocals*, i.e.

$$m1 \cdot m2 = -1 \quad \text{or} \quad m_1 = -\frac{1}{m_2}$$

Parallel and perpendicular lines

Exercise 6: let's check whether the given by equations or by points lines are *parallel*, *perpendicular* or *neither*.

a) $4x+5y = 8$ and $10x-8y = 3$

b) one line passes through the points $(1,2)$ and $(3,-1)$, another line passes through the points $(0,1)$ and $(-2,4)$

Forms of linear equations in two variables

Exercise 7: Find an equation of the line passing through the point (-2,-3) and parallel to the line with equation $2y-x=2$.

Forms of linear equations in two variables

Exercise 8: Find an equation of the line passing through the point (0,-3) and perpendicular to the line with equation $7x + 3y = 21$.