Forms of linear equations in two variables

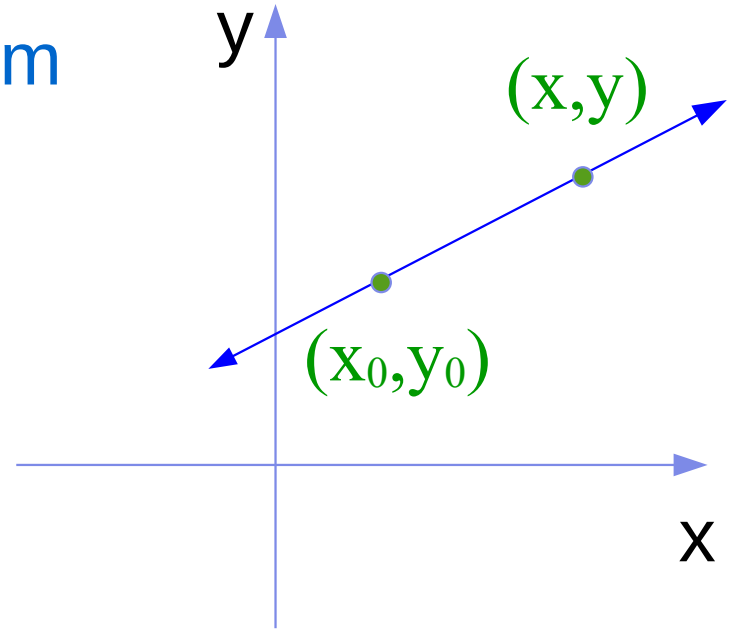
$Ax+By = C$ standard form *A,B,C are integers*

$y = mx + b$ slope-intercept form

slope m y-intercept $(0,b)$

$y-y_0 = m(x-x_0)$ point-slope form

slope m point (x_0,y_0)



Forms of linear equations in two variables

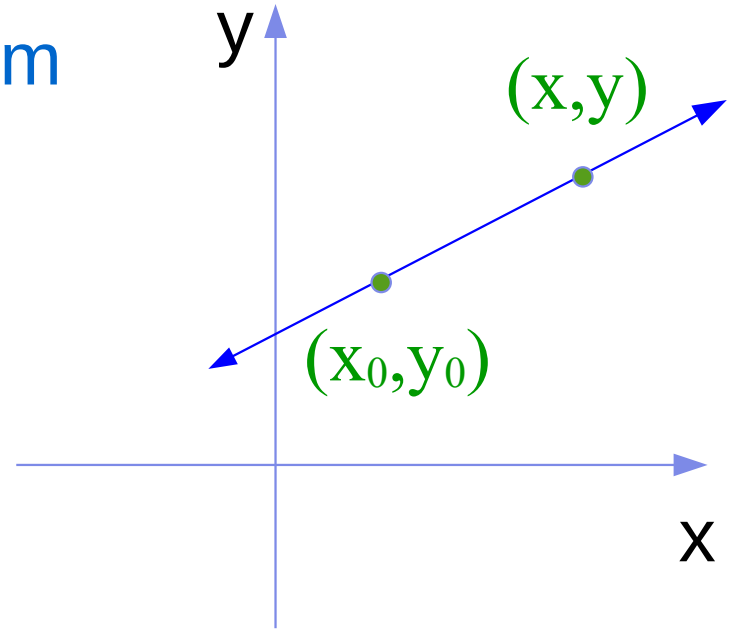
$2x-7y = -20$ standard form *2, -7, and -20 are integers*

$y = -3x + 6$ slope-intercept form

slope y-intercept $(0,b)$

$y-4 = m(x+5)$ point-slope form

slope point $(-5,4)$



Forms of linear equations in two variables

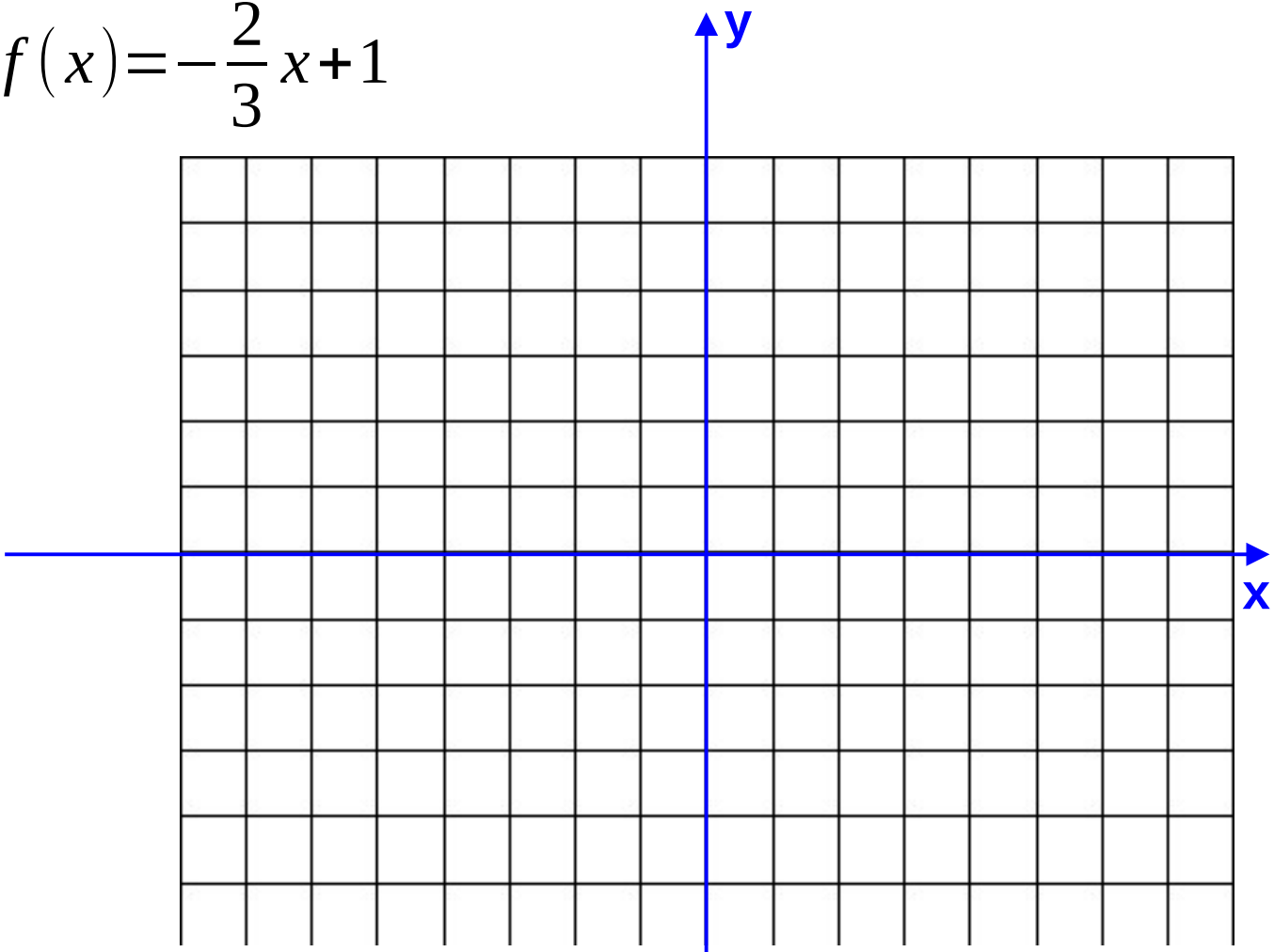
$$Ax+By=C$$
$$y=mx+b$$

Example:

Re-write the equation $7x-2y=6$ in *slope-intercept form*

Forms of linear equations in two variables

Example 2: Graph $f(x)=-\frac{2}{3}x+1$



Forms of linear equations in two variables

A linear function is a function whose graph is a line.

Linear functions can be written in the slope-intercept form of a line:

$f(x) = mx+b$, where

m is a *constant rate of change* (*slope*), and

$(0,b)$ is its *y-intercept*.

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recall Example 2:

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Forms of linear equations in two variables

slope-intercept form of a line:

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$m=-\frac{2}{3}$ $(0,1)$ is its *y-intercept*.

Forms of linear equations in two variables

slope-intercept form of a line:

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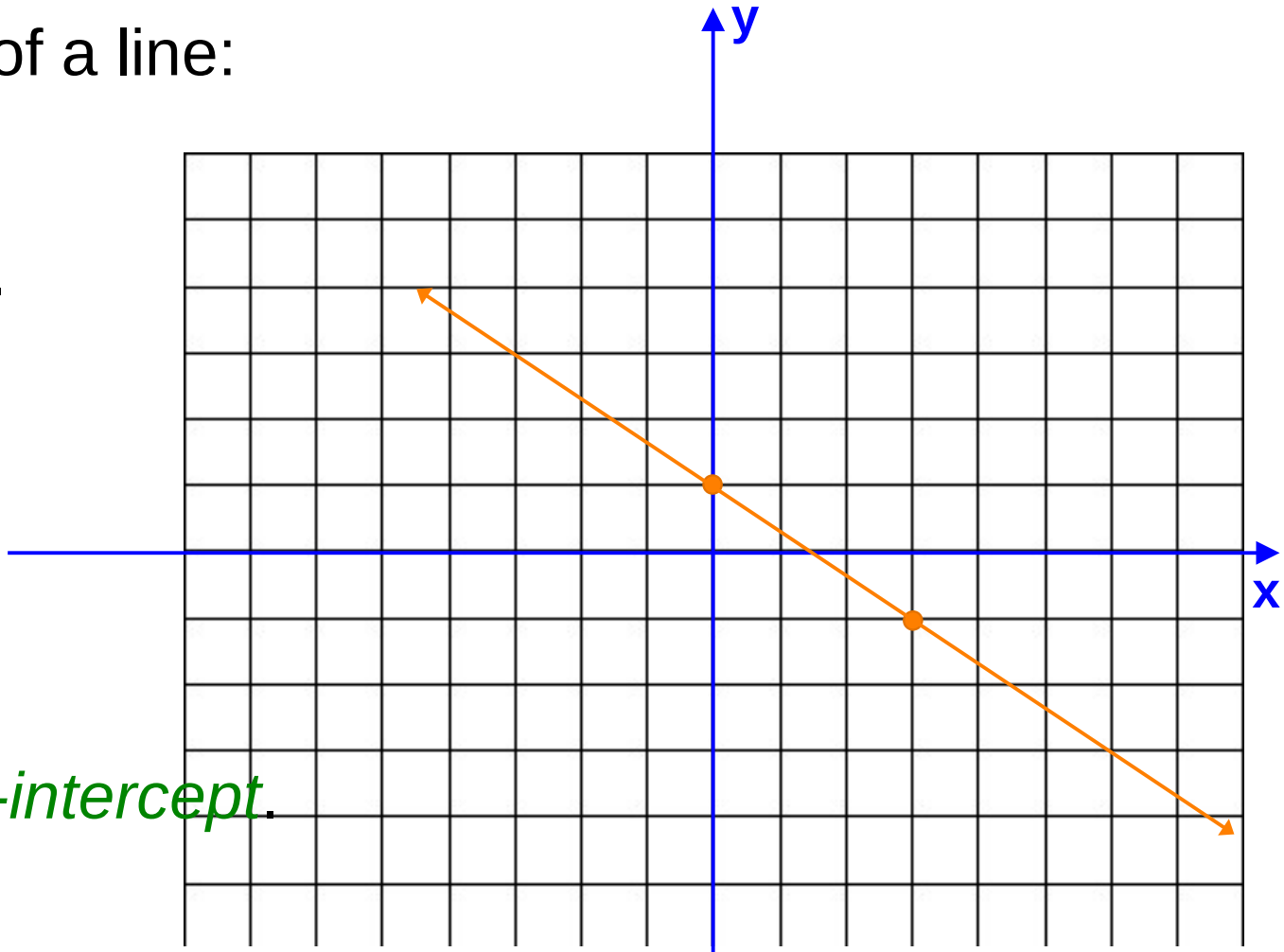
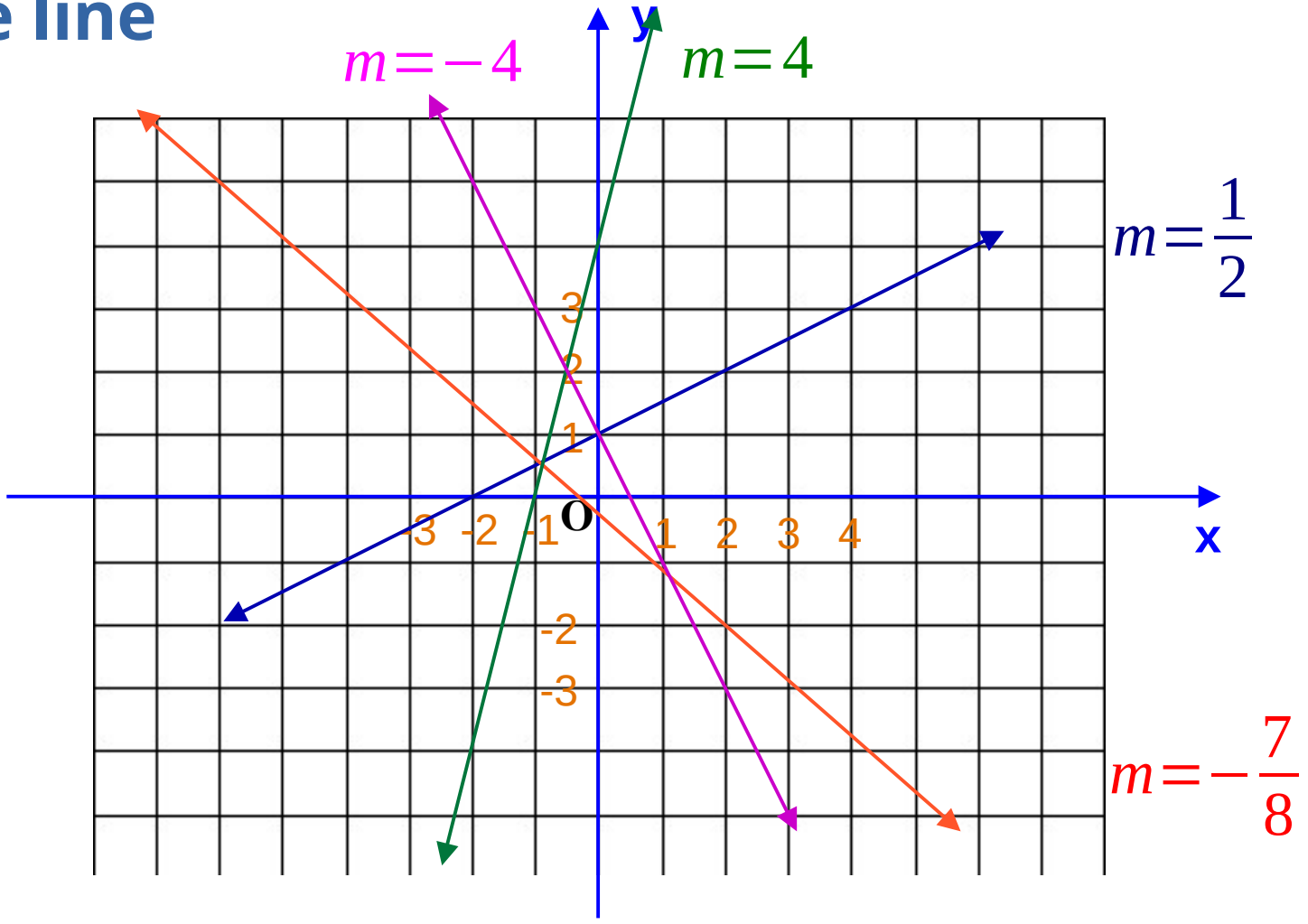
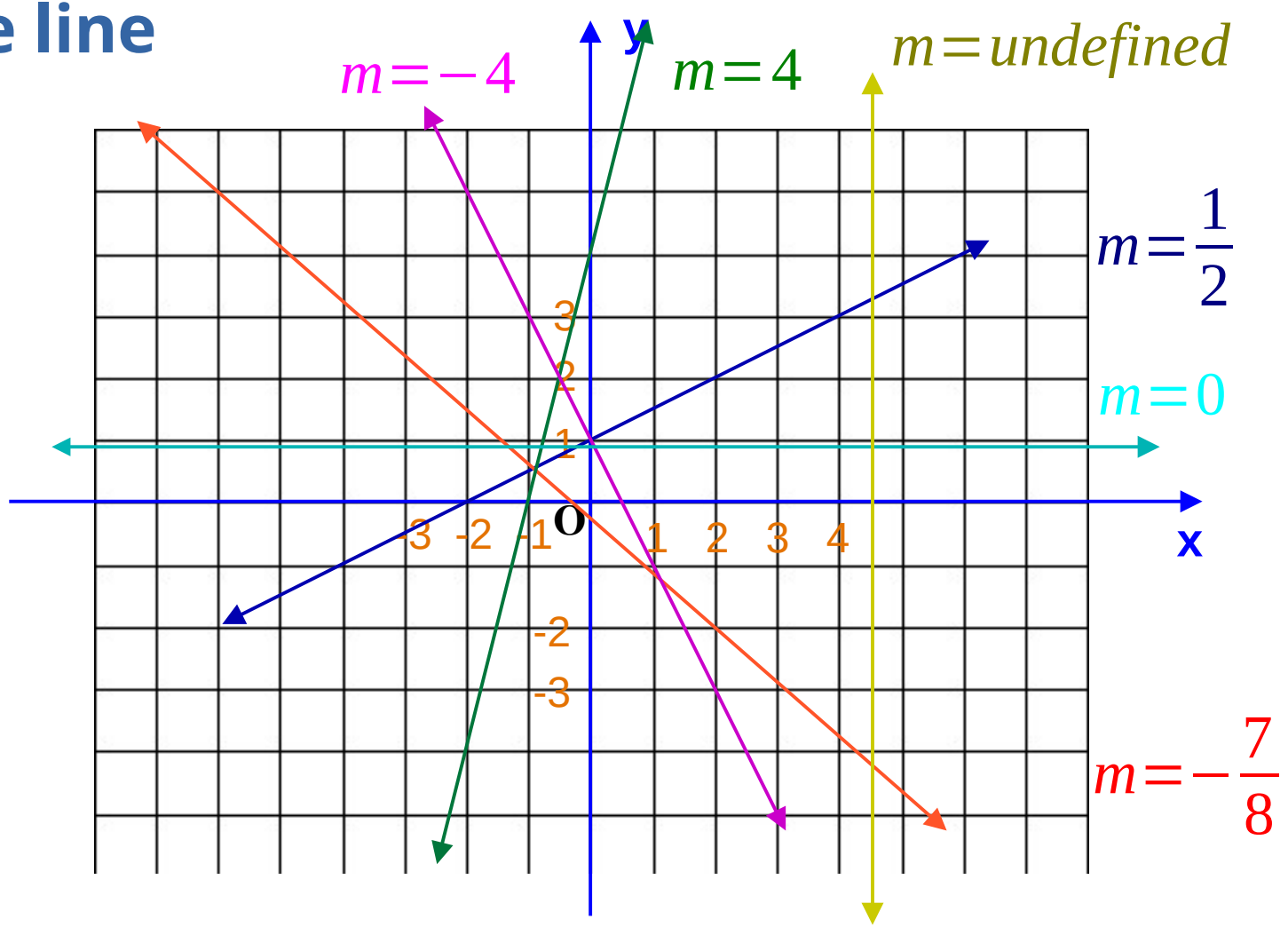


Slope of the line



Slope of the line



Slope of the line

Summary:

“up the hill”: *increasing function*

m > 0

“down the hill”: *decreasing function*

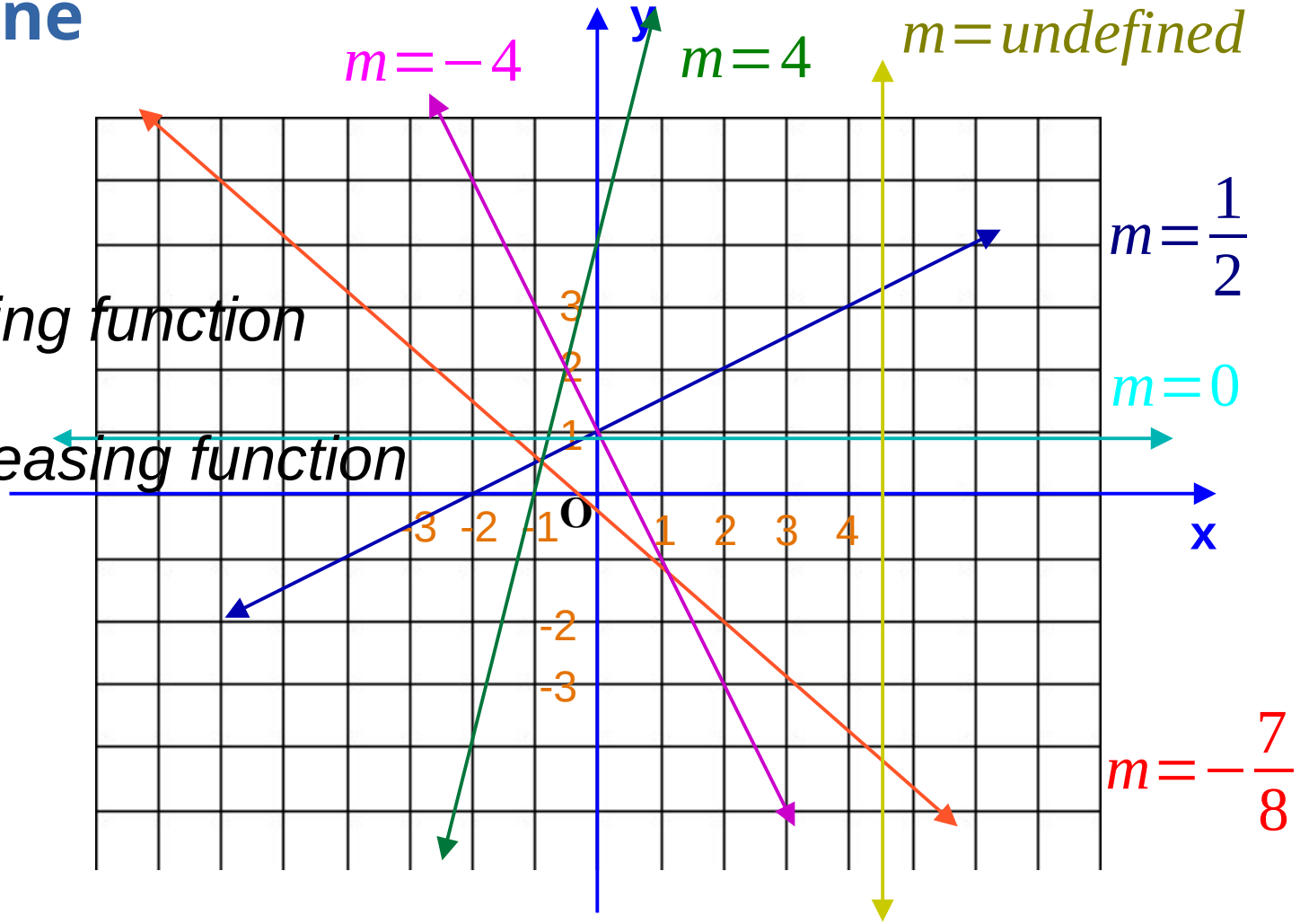
m < 0

horizontal line:

m = 0

vertical line:

m = undefined



Slope: calculating and interpreting

$$\textit{slope}\quad m=\frac{y_2-y_1}{x_2-x_1}=\frac{rise}{run}=\frac{\text{change in output}}{\text{change in input}}=\frac{\Delta y}{\Delta x}$$

$$m=\frac{f(x_2)-f(x_1)}{x_2-x_1}$$

Forms of linear equations in two variables

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Example 3:

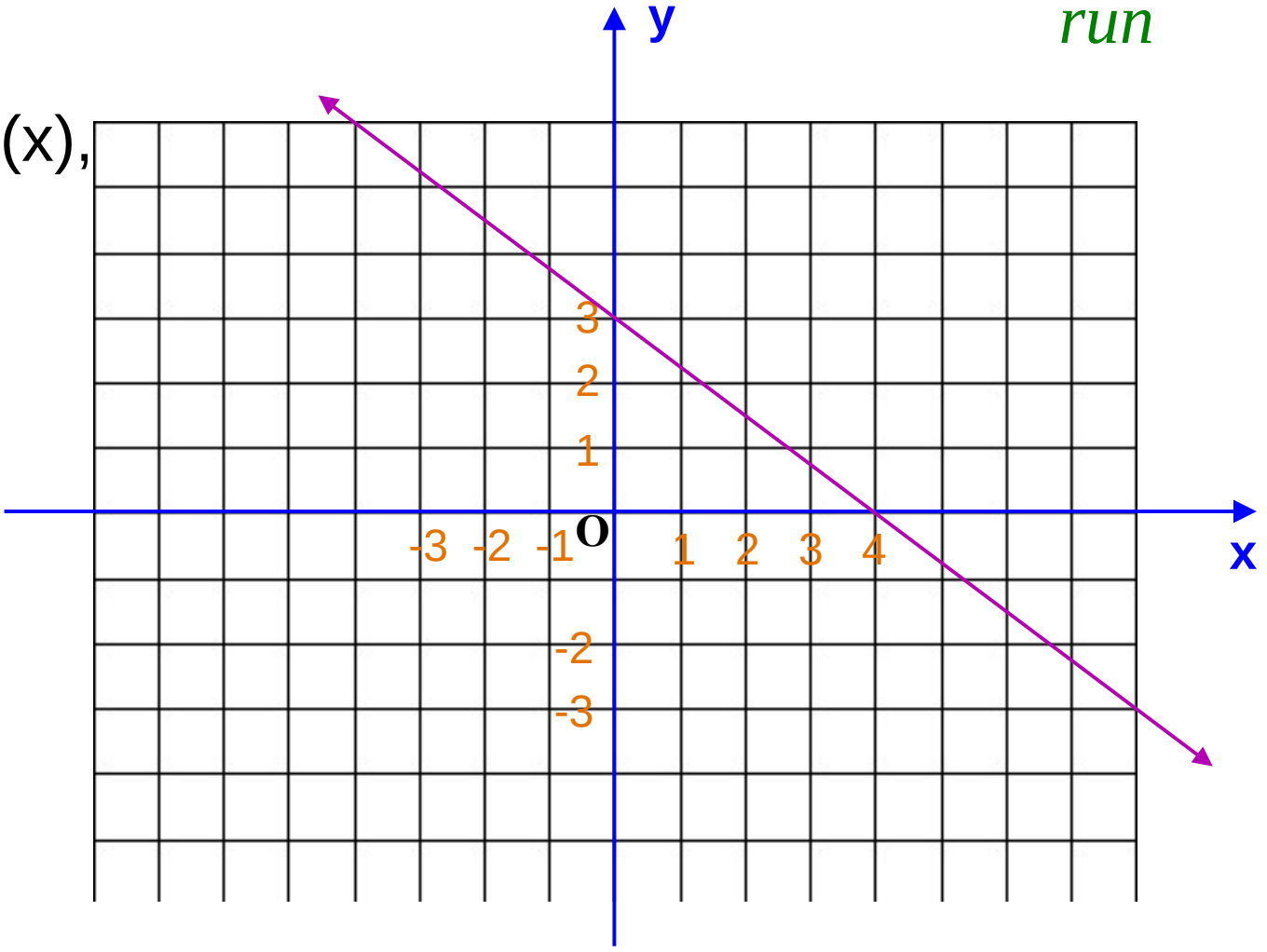
f(x) is a linear function that passes through the points (-2,3) and (-4,-7). Find its slope.

Forms of linear equations in two variables

$$m = \frac{rise}{run}$$

Example 4:

Given the graph of g(x), find its slope.



In-class practice

$y = mx + b$

Exercise 1: given equation 20x – 12y = 24:

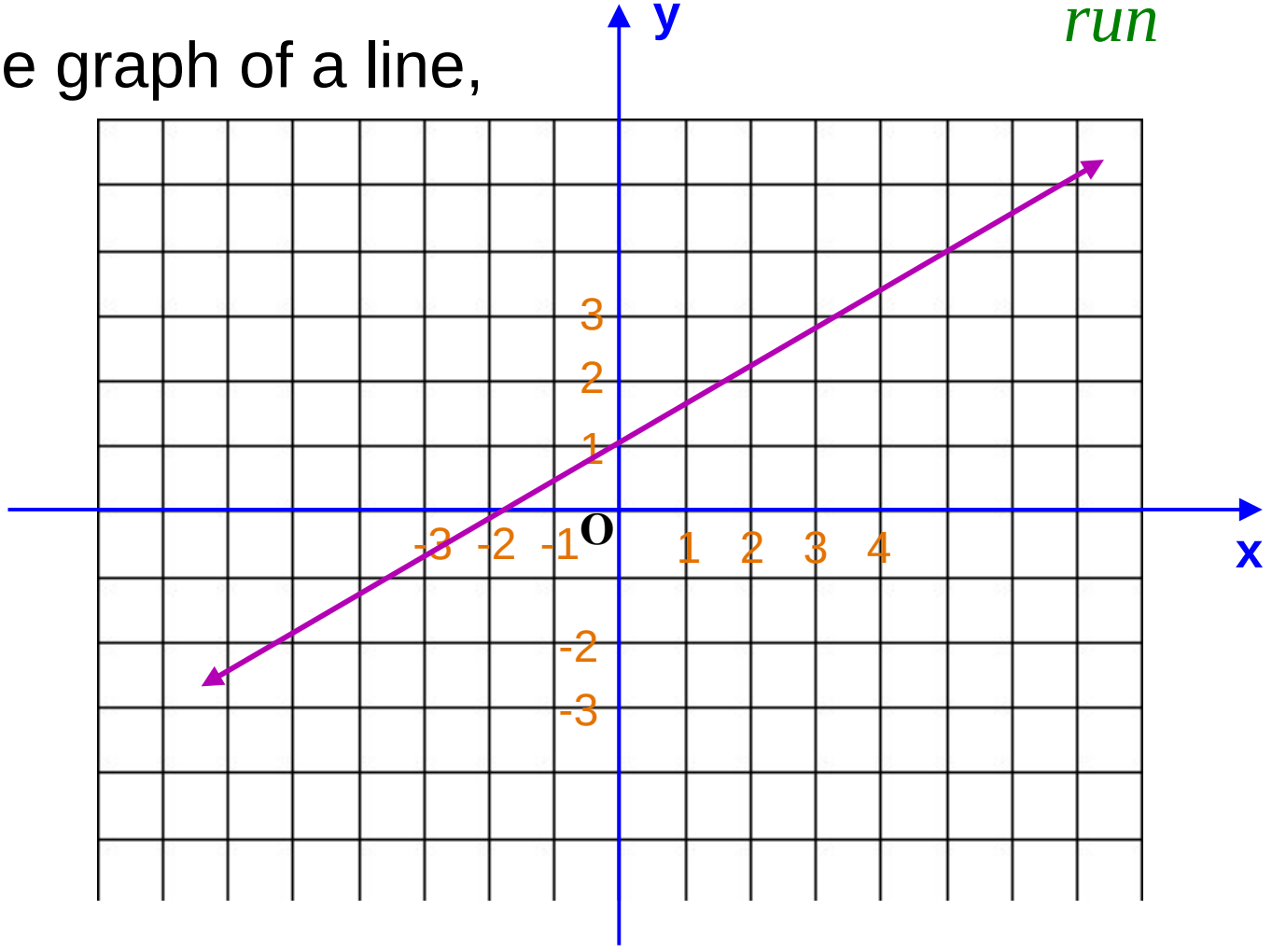
1) find *the slope* of the line representing its graph

2) find the y-intercept and x-intercept, if possible.

In-class practice

$$m = \frac{rise}{run}$$

Exercise 2: given the graph of a line, find its *slope.*



In-class practice

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Exercise 3:

f(x) is a linear function that passes through the points (-1,3) and (2,-5). Find its slope.

Forms of linear equations in two variables

$$y = mx + b$$

$$y\text{-}y_0 = m(x\text{-}x_0)$$

Example 5: The line is passing through the point (-4,5) and has a slope of $-\frac{5}{7}$. Find its equation in *point-slope form?*

Forms of linear equations in two variables

Example 6: Find the equation of the line passing through the points (-3,-5) and (2,5). Write it in all three forms: *standard form*, *slope-intercept form* and *point-slope form*.