

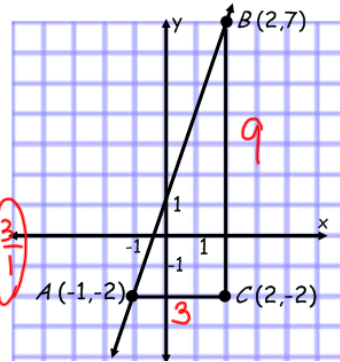
8 -1 Slopes and Equations of Lines - The Slope of a Line

Finding the slope of a line:

Slope of \overline{AB} = $\frac{\text{Change in vertical distance}}{\text{Change in horizontal distance}}$

Slope = $\frac{\text{rise}}{\text{run}}$
 = $\frac{\text{Change in } y}{\text{Change in } x}$

$m = \frac{9}{3} = 3$

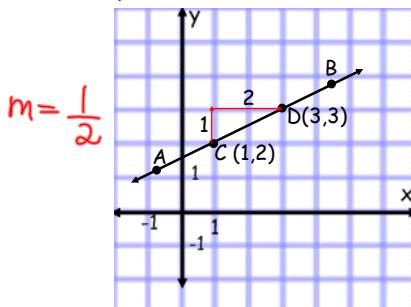


Procedure: To find the slope of a line

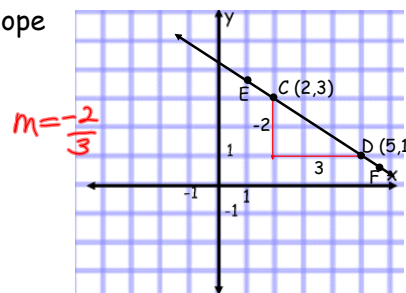
1. Select any two points on the line (x_1, y_1) (x_2, y_2)
2. Find the vertical change, that is, the change in the y -values by subtracting in any order.
3. Find the horizontal change, that is, the change in the x - values by subtracting the x -coordinates in the same order as the y 's.
4. Write the ratio of the vertical change to the horizontal change.

Formula for slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

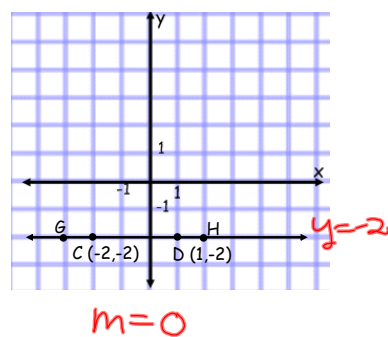
Positive Slope



Negative Slope

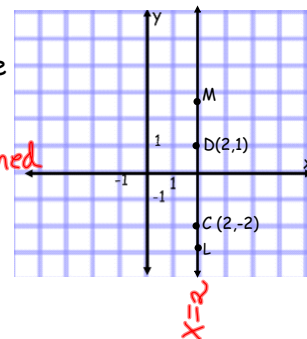


Zero Slope



No Slope

or undefined



Ex. 1: Find the slope of the line that is determined by the points $(-2, 4)$ and $(4, 2)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 4}{4 - (-2)} = \frac{-2}{6} = \frac{-1}{3}$$

down 1, Right 3

Ex. 2: Find the slope of the line that is determined by the points $(5, -3)$ and $(8, 2)$.

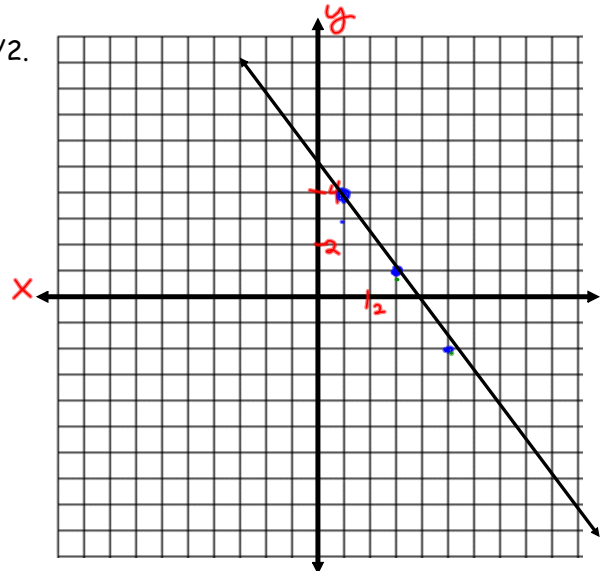
$$m = \frac{2 - (-3)}{8 - 5} = \frac{2 + 3}{3} = \frac{5}{3}$$

up 5, Right 3

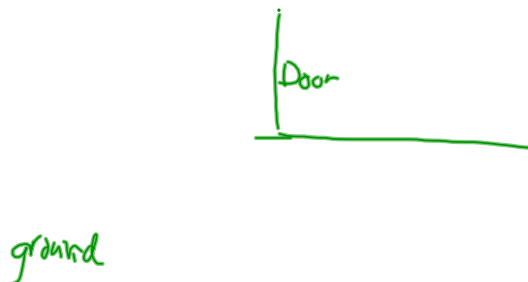
Ex. 3: Through point $(1, 4)$ draw the line whose slope is $3/2$.

down 3, Rt 2 $m = -\frac{3}{2}$

$$\frac{7}{-2} = -\frac{7}{2}$$



Ex. 4: The doorway of a building under construction is 3 feet above the ground. A ramp to reach the doorway is to have a slope of $2/5$. How far from the base of the building should the ramp begin?



2
5
3
3.

$$\frac{2}{5} = \frac{3}{x}$$

$$2x = 15$$

$$x = 7.5$$