Math 131 – Slope Review

SLOPE is a very important concept in higher mathematics. For now, we use slope to measure the steepness of the graph of a line. Moving forward, slope can give us all sorts of information in physical applications such as the velocity of a moving object.

There are different ways to determine the slope of a line; the approach you should take depends on the information given. $m = \text{Slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x} = \frac{rise}{run} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{y_2 - y_1}{x_2 - x_1}$

(1) Given a pair of points on the line (x_1, y_1) and (x_2, y_2), slope is measured by: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Example: Fine the slope of the line passing through the points (4,2) and (-1,7)

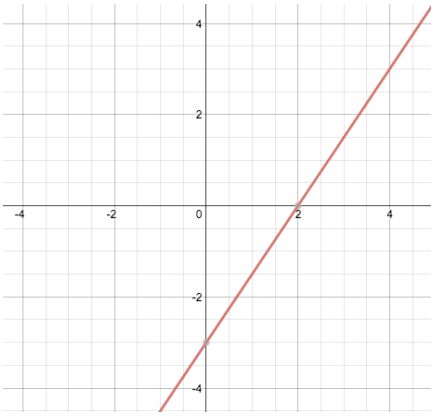
Special Case Example: Fine the slope of the line passing through the points (3,2) and (5,2)

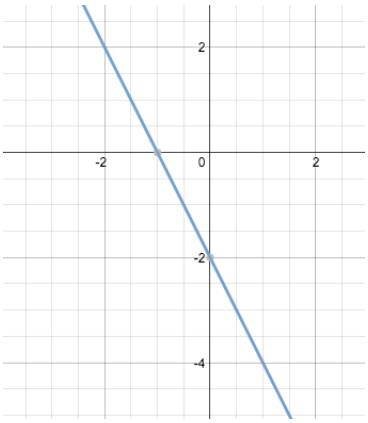
Special Case Example: Fine the slope of the line passing through the points (1,5) and (1,-2)

(2) Given the graph of a line:

Locate two points A and B as accurately as possible (preferably grid points) on the given line and count squares vertically from point A to point B (up yields positive, downward yields negative). This is called the rise or vertical change. Then count squares horizontally from point A to point B (right yields positive, left yields negative). This is called the run or horizontal change. $m = \frac{rise}{run}$

Example: Given the graphs below, compute the slope:





(3) Given an equation of the line, determine the slope directly by using slope intercept form, y=mx+b. (Solve the equation for y, then the slope will be the coefficient of x.)

Example: Find the slope of the line 2x-5y=8

Special Case Example: x=4

Special Case Example: y= -5

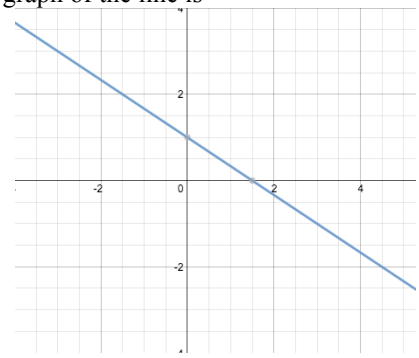
Try these:

Find the slope in each of the following problems:

1) The equation of the line is 5x-4y=8

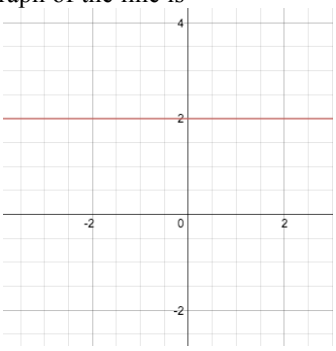
2) The line passes through (1,3) and (-3,4)

3) The graph of the line is

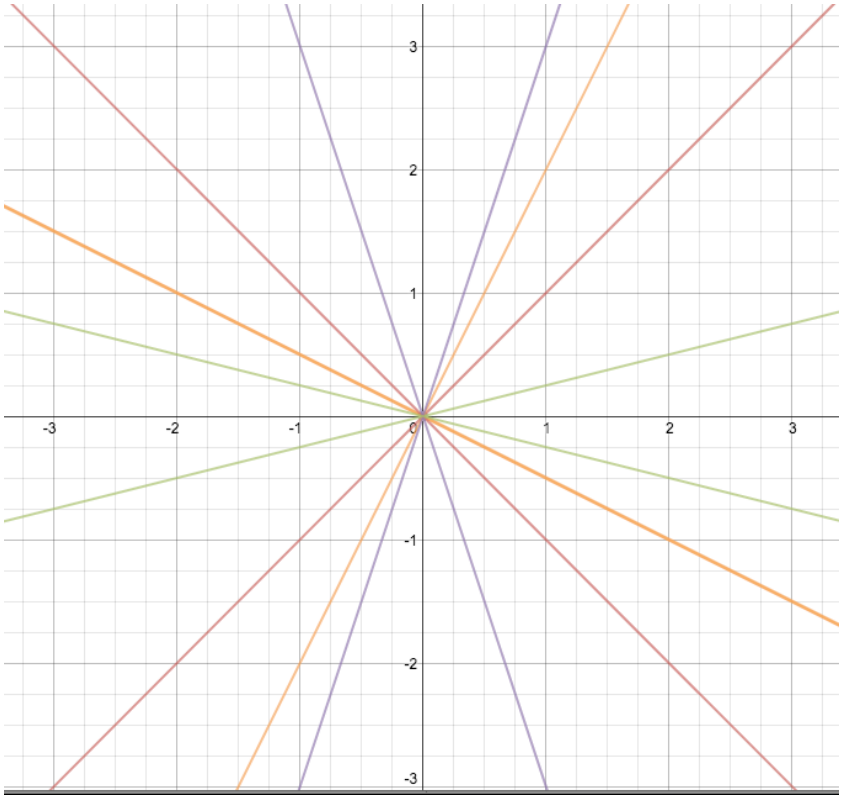


4) The equation of the line is x = 7

5) The graph of the line is



SLOPE AND STEEPNESS



OBSERVATIONS ABOUT SLOPE:

Lines with positive slopes: _____

Lines with negative slopes: _____

Steeper lines:_____

Flatter lines: _____

Horizontal lines: _____

Vertical lines: _____

OTHER FACTS ABOUT SLOPE – PARALLEL AND PERPENDICULAR LINES:

Parallel lines have equal slopes.

Perpendicular lines have slopes which are negative reciprocals $m_1 m_2 = -1$

Example: If point A= (4,2) and B- (-1,7),

a) Find the slope of a line parallel to AB
b) Find the slope of a line perpendicular to AB

Example: If line L is given by 2x+3y=7,

a) Find the slope of a line perpendicular to L
b) Find the slope of a line parallel to L