Math 1210 #1
Calculus: The Slope of a Line

There is only one line between any 2 points.

The slope of a line is:

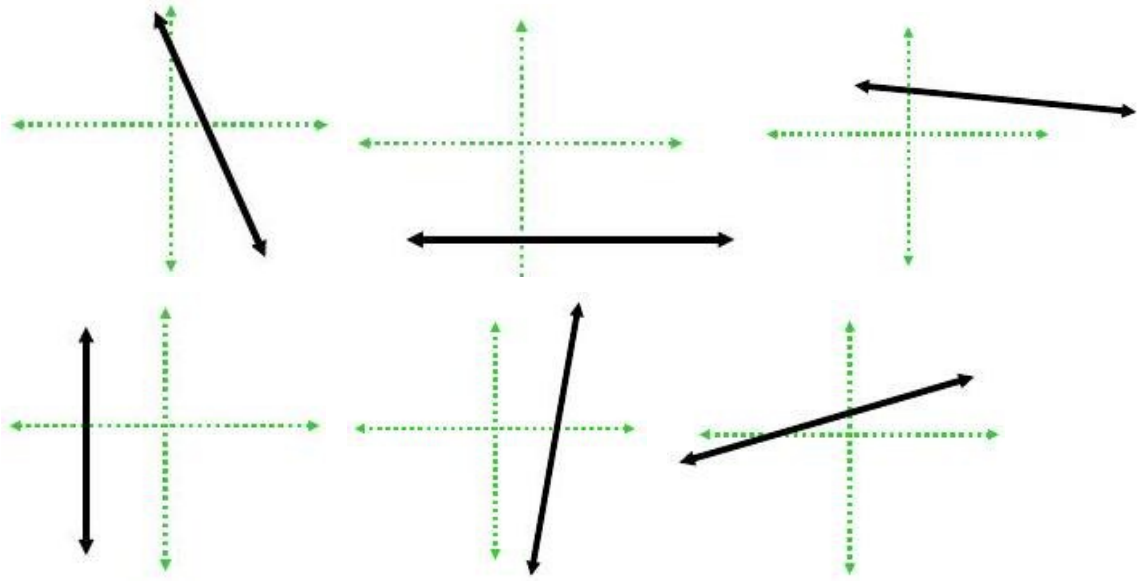
The steepness of the line.

The vertical change over the horizontal change, denoted by m.

Given two points, $(x_1, y_1), (x_2, y_2)$ in the Cartesian Plane,

$m =$

Examples of slope:



EX 1

1a)

Find the slope of the line containing these points: $(-3,2)$ and $(2,5)$

1b)

Find the slope of the line containing these points: (5, -6) and (-2,-6)

Point-Slope Form of a Line

Given that $m =$ the slope of a line and it goes through the point (x_1, y_1), then we know:

Slope-Intercept Form of a Line

Given that the slope of a line is m and the y -intercept is the point $(0, b)$, then the equation of the line is:

EX 2

2a)

Find the equation of the line going through $(-4,1)$ and $(5,2)$.

2b)

Find the equation of the line with slope, $m = 3$ and y -intercept $(0,5)$.

General Equation of a Line

Every line can be written in the form $Ax + By + C = 0$, where A, B, and C are integers.

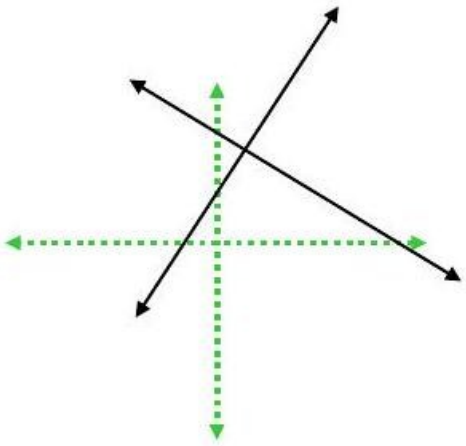
EX 3

Write the equations from Exercise 2 in general form.

Parallel and Perpendicular Lines

Parallel lines have the same slope.

Perpendicular lines have negative reciprocal slopes.



EX 4

4a)

Find the equation of the line parallel to $3x - 4y = 8$ which passes through the point (1,3).

4b)

Find the equation of the line perpendicular to $y = -3x + 5$ which passes through the origin.

Determine the slope of each line segment in this function.