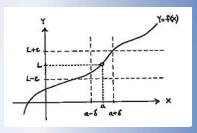
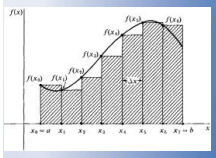
1 Slope of a Line



$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

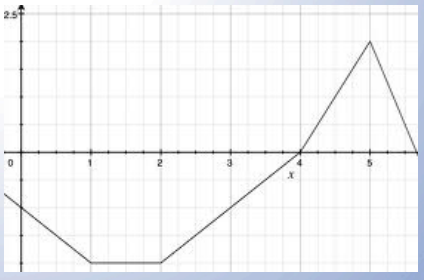
$$\frac{d}{dx} \int_a^x f(t)\,dt = f(x)$$



$$\lim_{\max \Delta x_i \to 0} \sum_{1}^{n} f(x_i)\Delta x_i = \int_a^b f(x)dx$$

$$\int_a^b \mathrm{f}(x)\,dx = \mathrm{F}(b) - \mathrm{F}(a)$$

Calculus: The Slope of a Line



There is only one line between any 2 points.

The slope of a line is:

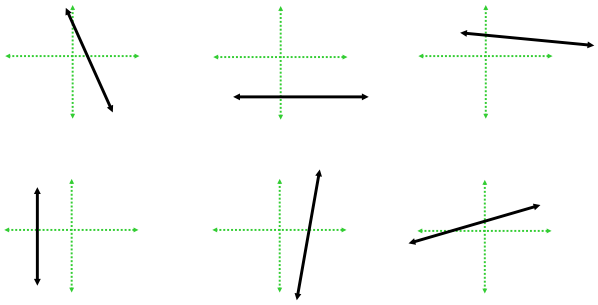
The steepness of the line.

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

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

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

1 Slope of a Line

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

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

b) 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

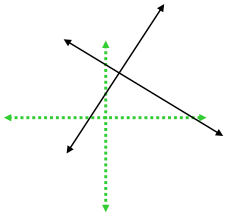
Write the equations from Exercise 2 in general form.

1 Slope of a Line

Parallel and Perpendicular Lines

Parallel lines have the same slope.

Perpendicular lines have negative reciprocal slopes.



EX4

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

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

1 Slope of a Line

Determine the slope of each line segment in this function.