Average Rate of Change & Secant Line

Average Rate of Change $= \frac{f(x_2)-f(x_1)}{x_2-x_1} = \frac{f(x_1)-f(x_2)}{x_1-x_2}$

Average Rate of Change is a single number indicating a rough amount computed for some measurablte entity that changes or varies with time.

A **Secant Line**, also simply called a secant, is a line passing through two points of a curve.

Therefore **slope of a secant line** is the same as the Average Rate of Change.

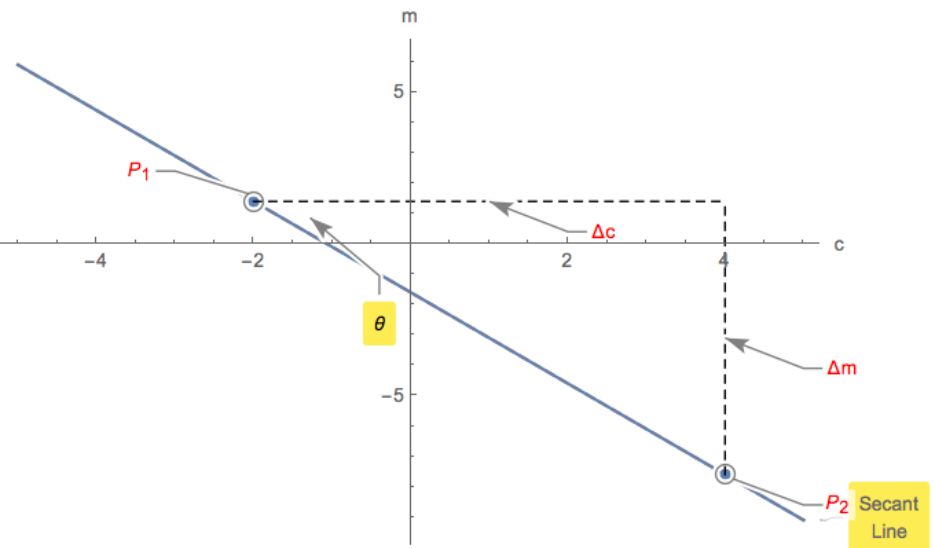
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

$A = \frac{f(x)-f(x_1)}{x-x_1} \Rightarrow A(x-x_1) = f(x)-f(x_1) \Rightarrow A(x-x_1)+f(x_1) = f(x)$

$f(x) = Ax + (f(x_1) - Ax_1)$

Example 1.

$m = -\frac{3c}{2} - \frac{8}{5}$ average between -2, 4



$\Delta m = m(4) - m(-2) = -\frac{3(4)}{2} - \frac{8}{5} - \left(-\frac{3(-2)}{2} - \frac{8}{5}\right) = -9$

Secant Slope $= \text{Tan}(\theta) = \frac{m(4)-m(-2)}{4-(-2)} = -\frac{3}{2}$

Average Rate of Change $= A = -\frac{3}{2}$

Secant Line: $m = -\frac{3}{2}c + \left(-\frac{8}{5}\right)$

m could be temperature of a cup of tea and c time.
m could be speed of a car and c time.
m could be gasoline amount and c distance traveled.