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.

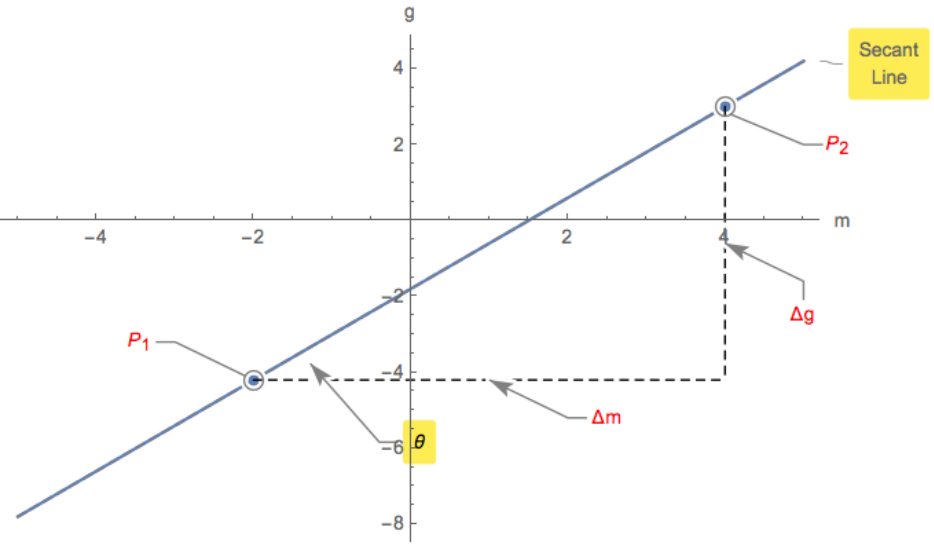
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

Example 1.

$g = \frac{6m}{5} - \frac{9}{5}$ average between -2, 4



$$\Delta g = g(4) - g(-2) = \frac{6(4)}{5} - \frac{9}{5} - \left(\frac{6(-2)}{5} - \frac{9}{5}\right) = \frac{36}{5}$$

Secant Slope $= \text{Tan}(\theta) = \frac{g(4)-g(-2)}{4-(-2)} = \frac{6}{5}$

Average Rate of Change $= A = \frac{6}{5}$

Secant Line: $g = \frac{6}{5}m + (-\frac{9}{5})$

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