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.

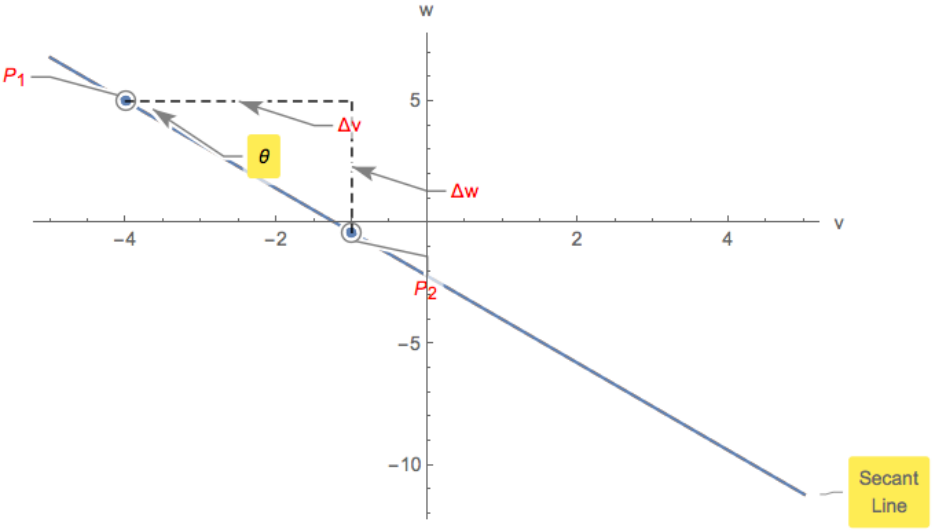
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

Example 1.

$w=-\frac{9v}{5}-\frac{11}{5}$ average between -4, -1



$$\Delta w = w(-1)-w(-4) = -\frac{9(-1)}{5}-\frac{11}{5}-\left(-\frac{9(-4)}{5}-\frac{11}{5}\right) = -\frac{27}{5}$$

Secant Slope $= \text{Tan}(\theta) = \frac{w(-1)-w(-4)}{(-1)-(-4)} = -\frac{9}{5}$

Average Rate of Change $= A = -\frac{9}{5}$

Secant Line: $w = -\frac{9}{5}v+\left(-\frac{11}{5}\right)$

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