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.

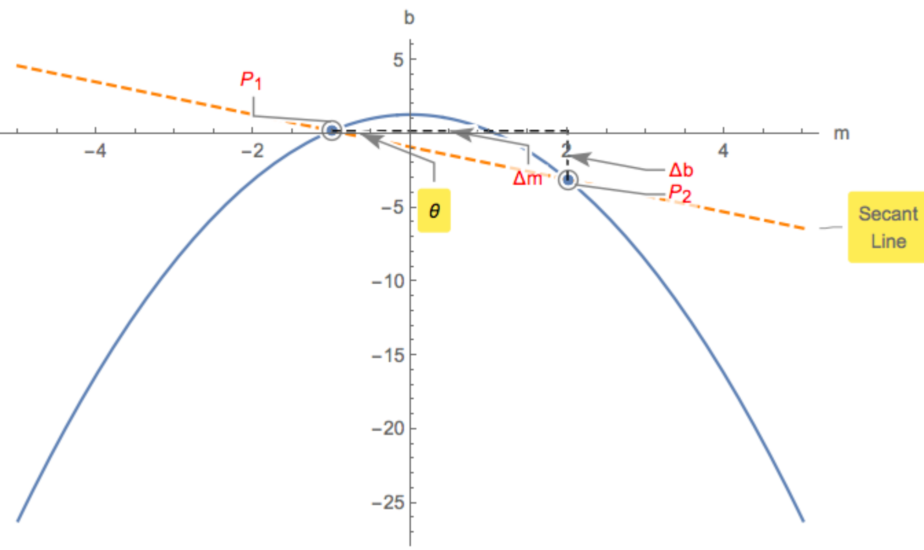
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

$$\boxed{f(x)=Ax+(f(x_1)-Ax_1)}$$

Example 1.

$b=\frac{13}{10}-\frac{11\,m^2}{10}$ average between -1, 2



$$\Delta b=b(2)-b(-1)=\frac{13}{10}-\frac{11\,(2)^2}{10}-\left(\frac{13}{10}-\frac{11\,(-1)^2}{10}\right)=-\frac{33}{10}$$

Secant Slope$=\mathrm{Tan}(\theta)=\frac{b(2)-b(-1)}{2-(-1)}=-\frac{11}{10}$

Average Rate of Change$=A=-\frac{11}{10}$

Secant Line: $b=\boxed{-\frac{11}{10}}m+\left(-\frac{9}{10}\right)$

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