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.

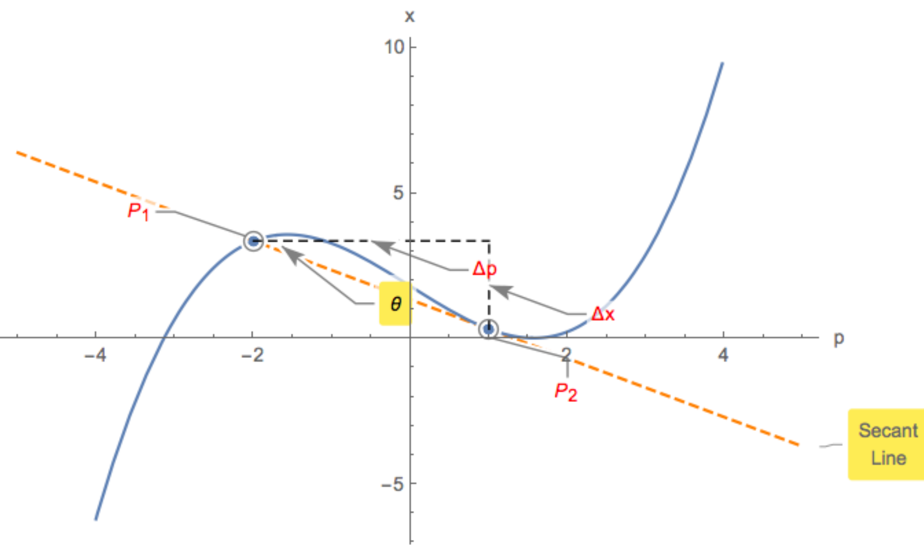
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

Example 1.

$x=\frac{23p^3}{100}-\frac{17p}{10}+\frac{9}{5}$ average between −2, 1



$\Delta x=x(1)-x(-2)=\frac{23(1)^3}{100}-\frac{17(1)}{10}+\frac{9}{5}-\left(\frac{23(-2)^3}{100}-\frac{17(-2)}{10}+\frac{9}{5}\right)=-\frac{303}{100}$

Secant Slope$=\operatorname{Tan}(\theta)=\frac{x(1)-x(-2)}{1-(-2)}=-\frac{101}{100}$

Average Rate of Change$=A=-\frac{101}{100}$

Secant Line: $x=-\frac{101}{100}p+\frac{67}{50}$

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