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.

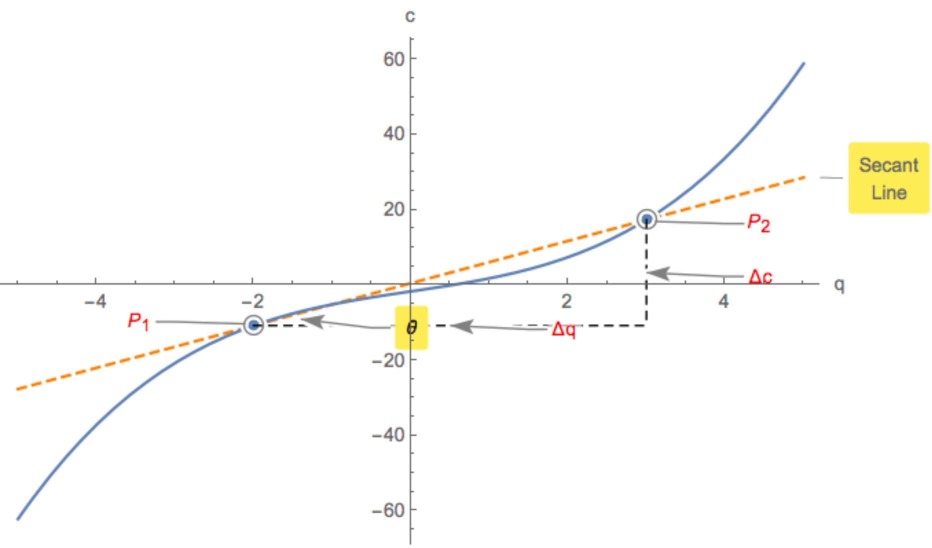
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

Example 1.

$c=\frac{9q^3}{25}+\frac{31q}{10}-\frac{17}{10}$ average between −2, 3



$\Delta c=c(3)-c(-2)=\frac{9(3)^3}{25}+\frac{31(3)}{10}-\frac{17}{10}-\left(\frac{9(-2)^3}{25}+\frac{31(-2)}{10}-\frac{17}{10}\right)=\frac{281}{10}$

Secant Slope$=\text{Tan}(\theta)=\frac{c(3)-c(-2)}{3-(-2)}=\frac{281}{50}$

Average Rate of Change$=A=\frac{281}{50}$

Secant Line: $c=\frac{281}{50}q+\frac{23}{50}$

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