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.

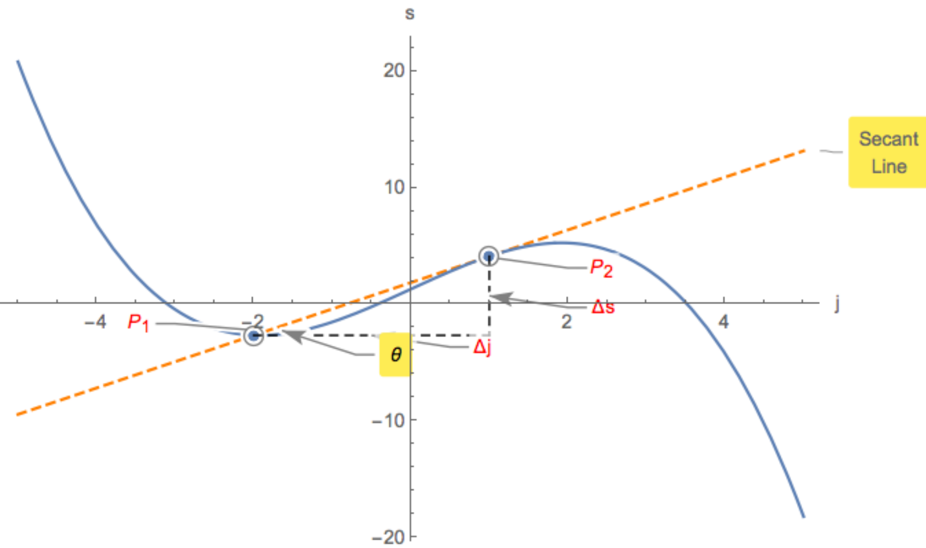
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

Example 1.

$s=-\frac{7j^3}{25}+\frac{31j}{10}+\frac{13}{10}$ average between -2, 1



$\Delta s=s(1)-s(-2)=-\frac{7(1)^3}{25}+\frac{31(1)}{10}+\frac{13}{10}-\left(-\frac{7}{25}(-2)^3+\frac{31(-2)}{10}+\frac{13}{10}\right)=\frac{339}{50}$

Secant Slope$=\mathrm{Tan}(\theta)=\frac{s(1)-s(-2)}{1-(-2)}=\frac{113}{50}$

Average Rate of Change$=A=\frac{113}{50}$

Secant Line: $s=\frac{113}{50}j+\frac{93}{50}$

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