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.

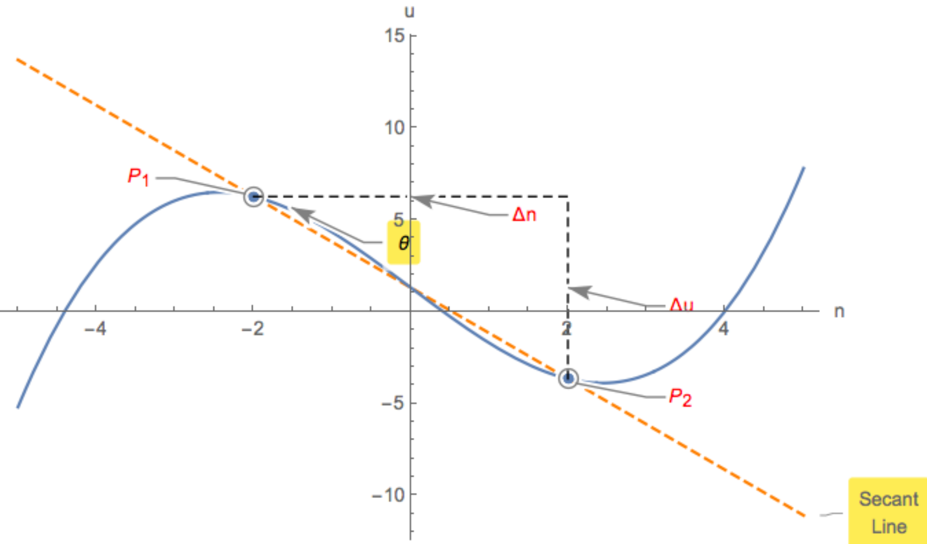
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

Example 1.

$u=\frac{9n^3}{50}-\frac{16n}{5}+\frac{13}{10}$ average between −2, 2



$\Delta u=u(2)-u(-2)=\frac{9(2)^3}{50}-\frac{16(2)}{5}+\frac{13}{10}-\left(\frac{9(-2)^3}{50}-\frac{16(-2)}{5}+\frac{13}{10}\right)=-\frac{248}{25}$

Secant Slope$=\mathrm{Tan}(\Theta)=\frac{u(2)-u(-2)}{2-(-2)}=-\frac{62}{25}$

Average Rate of Change$=A=-\frac{62}{25}$

Secant Line: $u=-\frac{62}{25}n+\frac{13}{10}$

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