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.

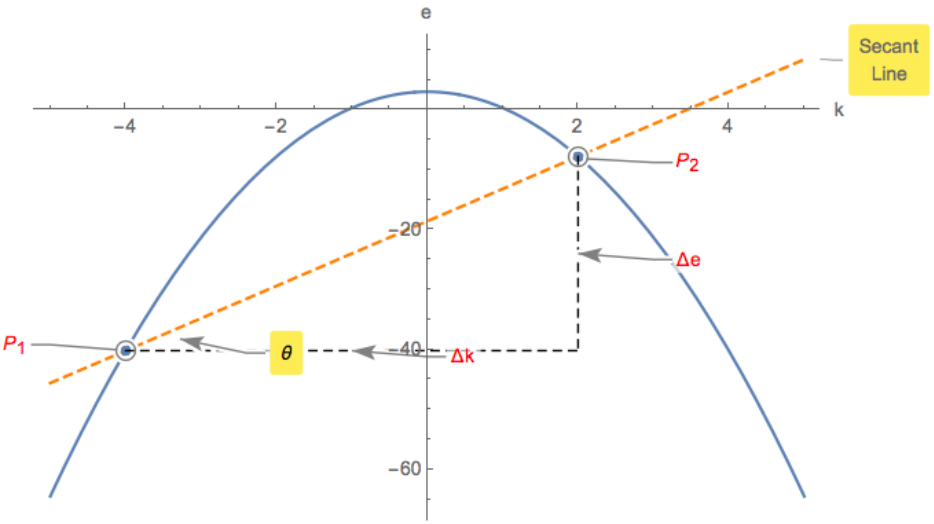
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

Example 1.

$e = 3 - \frac{27\,k^2}{10}$ average between -4, 2



$\Delta e = e(2) - e(-4) = 3 - \frac{27\,(2)^2}{10} - \left(3 - \frac{27\,(-4)^2}{10}\right) = \frac{162}{5}$

Secant Slope $= \text{Tan}(\theta) = \frac{e(2)-e(-4)}{2-(-4)} = \frac{27}{5}$

Average Rate of Change $= A = \frac{27}{5}$

Secant Line: $e = \frac{27}{5}k + \left(-\frac{93}{5}\right)$

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