Average Rate of Change & Secant Line

Average Rate of Change $= \dfrac{f(x_2) - f(x_1)}{x_2 - x_1} = \dfrac{f(x_1) - f(x_2)}{x_1 - x_2}$

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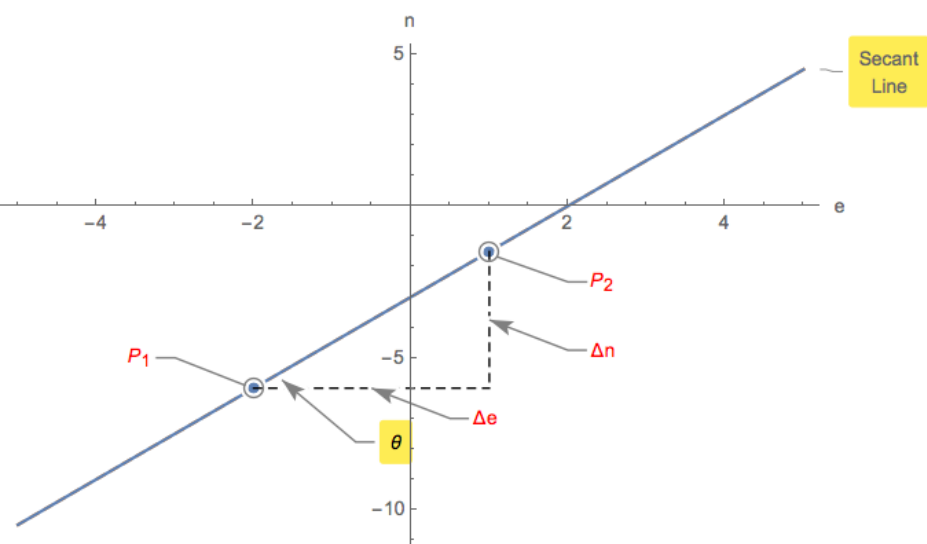
$A = \dfrac{f(x) - f(x_1)}{x - x_1} \Longrightarrow A(x - x_1) = f(x) - f(x_1) \Longrightarrow A(x - x_1) + f(x_1) = f(x)$

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

Example 1.

$n = \dfrac{3\,e}{2} - 3$ average between −2, 1

$\Delta n = n(1) - n(-2) = \dfrac{3\,(1)}{2} - 3 - \left(\dfrac{3\,(-2)}{2} - 3\right) = \dfrac{9}{2}$

Secant Slope $= \text{Tan}(\Theta) = \dfrac{n(1) - n(-2)}{1 - (-2)} = \dfrac{3}{2}$

Average Rate of Change $= A = \dfrac{3}{2}$

Secant Line: $n = \dfrac{3}{2}\,e + (-3)$

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