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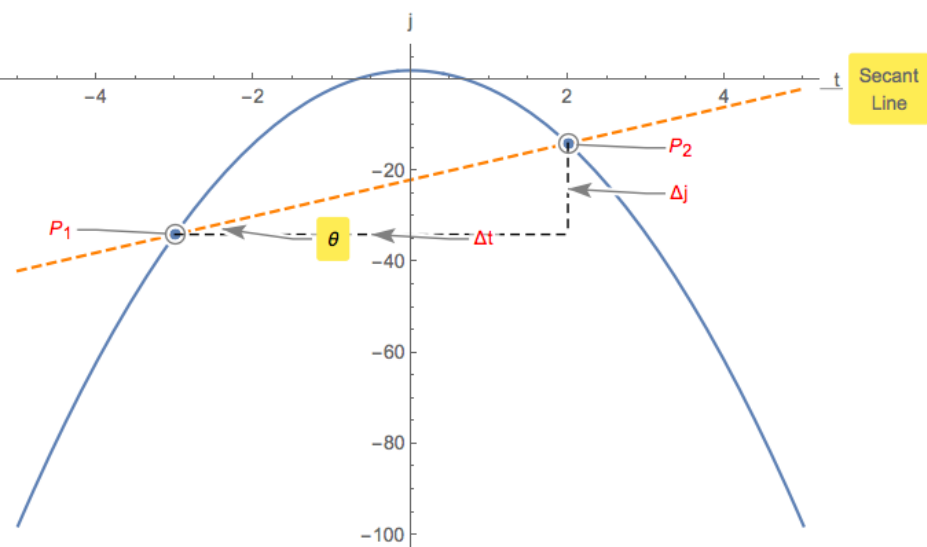
$A=\dfrac{f(x)-f(x_1)}{x-x_1}\Longrightarrow A(x-x_1)=f(x)-f(x_1)\Longrightarrow A(x-x_1)+f(x_1)=f(x)$

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

Example 1.

$j=2-4\,t^2$ average between -3, 2

$\Delta j=j(2)-j(-3)=2-4(2)^2-\left(2-4(-3)^2\right)=20$

Secant Slope$=\text{Tan}(\theta)=\dfrac{j(2)-j(-3)}{2-(-3)}=4$

Average Rate of Change$=A=4$

Secant Line: $j=\boxed{4}\,t+(-22)$

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