# 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.

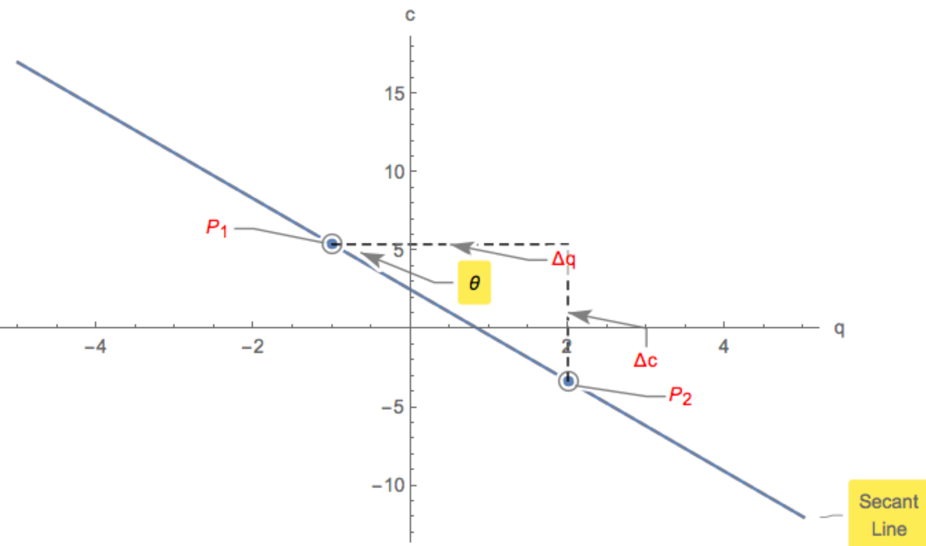
Equation for Secant Line, if **A** indicates Average Rate of Change while **f**(x) indicates horizontal axis value for secant line computes as follows:

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

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

## Example 1.

$c=\frac{5}{2}-\frac{29q}{10}$ average between −1, 2




$\Delta c=c(2)-c(-1)=\frac{5}{2}-\frac{29(2)}{10}-\left(\frac{5}{2}-\frac{29(-1)}{10}\right)=-\frac{87}{10}$

**Secant Slope**$=\text{Tan}(\theta)=\frac{c(2)-c(-1)}{2-(-1)}=-\frac{29}{10}$

**Average Rate of Change**$=A=-\frac{29}{10}$

**Secant Line:** $c=-\frac{29}{10}q+\frac{5}{2}$

c could be temperature of a cup of tea and q time.

c could be speed of a car and q time.

c could be gasoline amount and q distance traveled.