FORMULAS FROM SECTION 2.1

Change Formulas

Change: new output – old output

% Change: \( \frac{(new \ output - old \ output)}{(old \ output)} \)

Avg. Rate of Change: \( \frac{y_2 - y_1}{x_2 - x_1} \), or \( \frac{(new \ output - old \ output)}{(new \ input - old \ input)} \)

Units for Change Formulas

Change: Units of output

% Change: %

Avg. Rate of Change: Units of output per single unit of input

How to write down an interpretation of a change answer:

1. When? – state the given interval
2. What? – state the changing quantity
3. How? – increasing or decreasing
4. By how much? – numerical answer w/ units

Compound Interest Formulas

\( n \)-compoundings per year: \( A = P \left(1 + \frac{r}{n}\right)^{nt} \)

Continuous compounding: \( A = Pe^{rt} \)

What the variables mean:

\( A \): final amount of $
\( P \): principal amount, i.e. the initial investment
\( r \): interest rate (in decimal form)
\( n \): # of compoundings/year
\( t \): time in years

APR and APY

Nominal rate (APR) - Annual Percentage Rate
\( r \) (in decimal form) or \( 100r\% \) (as a percentage)

Effective rate (APY) – Annual Percentage Yield:

\( n \)- compoundings/year: \( \left(1 + \frac{r}{n}\right)^n - 1 \)

continuously compounding: \( e^r - 1 \)