Assignment 1

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1. *What is the formula for compound interest?*

$$P' = P(1 + \frac{r}{n})^{nt}$$

Where:

P is the starting balance

P' is the resulting balance

r is the interest rate for a given period of time

n is the number of compounding intervals per rate

t is the number of time periods total.

Ex: if r is 5% annually, then n would be the number of compounding periods within a year (such as one per month = 12), and t would be the number of years.

As such, a $P = \$1000$ loan at $r = 5\%$ per annum, with $n = 12$ compounding periods and no loan payments for $t = 4$ years would have a balance of:

$$P' = 1000 \times (1 + \frac{0.05}{12})^{12 \times 4}$$
$$P' = \$1220.90$$

2. *What is the derivative of e^x?*

$$\frac{d}{dx} e^x = e^x$$