Mathematical Formulas

Simple Interest $\qquad\qquad\qquad I = Prt \qquad\qquad\qquad A = P + Prt$

Compound Interest $\qquad A = P\left(1+\dfrac{r}{n}\right)^{nt}\qquad$ or $\qquad P = \dfrac{A}{\left(1+\dfrac{r}{n}\right)^{nt}}$

Continuously Compounded

$$A = Pe^{rt}\qquad\text{or}\qquad P = \dfrac{A}{e^{rt}}$$

Savings Plans $\qquad A = \dfrac{d\left[\left(1+\dfrac{r}{n}\right)^{nt}-1\right]}{\left(\dfrac{r}{n}\right)}\qquad$ or $\qquad d = \dfrac{A\left(\dfrac{r}{n}\right)}{\left[\left(1+\dfrac{r}{n}\right)^{nt}-1\right]}$

Loans $\qquad P = \dfrac{d\left(1-\left(1+\dfrac{r}{n}\right)^{-nt}\right)}{\left(\dfrac{r}{n}\right)}\qquad$ or $\qquad d = \dfrac{P\left(\dfrac{r}{n}\right)}{\left(1-\left(1+\dfrac{r}{n}\right)^{-nt}\right)}$

P is the principal, starting amount, or present value
d is your loan payment (your monthly payment, annual payment, etc.)
r is the annual interest rate in decimal form
n is the number of compounding periods in one year
t is the length of the loan, in years
A is the end amount or future value

If the compounding frequency is not always explicitly given, it is determined by how often you make payments

Spreadsheet Formulas

=principal+principal*rate*time

=FV(rate per period, number of periods, payment amount, present value)

=principal*EXP(yearly rate*years)

=PV(rate per period, number of periods, payment amount, future value)

=PMT(rate per period, number of periods, present value, future value)

=EFFECT(stated rate, number of compounding periods per year)

rate per period	is the interest rate per compounding period, r/n
number of periods	is the total number of periods, $n*t$
payment amount	is the amount of regular payments, d
present value	is the amount deposited or principal, P
future value	is the amount you want in the future, *0 for a loan*