Finance Formulas

Variables:
m: number of compounding periods per year  P: principal or present value
i: interest rate per period  A or S: future value
n: total periodic payment in an annuity  R: the periodic payment in an annuity

Simple Interest

Interest  $I = Prt$

Compound Interest:

Periodic:  $A = P(1 + i)^n$
Continuous:  $A = Pe^{rt}$

Effective Rate:  $r_e = \left(1 + \frac{r}{m}\right)^m - 1$

Annuities

A sequence of equal payments made at equal periods of time is called an annuity.

Future Value of an Ordinary Annuity: The future value $S$ of an ordinary annuity of $n$ payments of $R$ dollars each at the end of consecutive interest periods.

$S = R \left[ \frac{(1+i)^n - 1}{i} \right]$

Future Value of an Annuity Due: annuities where payments are made at the beginning of each period.

$S = R \left[ \frac{(1+i)^n - 1}{i} \right] - R$

Present Value of an Ordinary Annuity: The present value $P$ of an annuity of $n$ payments of $R$ dollars each at the end of consecutive interest periods.

$P = R \left[ \frac{1-(1+i)^n}{i} \right]$

Amortization Payments:  $R = \frac{Pi}{1 - (1+i)^{-n}}$