Formulas

Compound Amount: To find F, given P

$(F/P, i, n)$ $$F = P(1+i)^n$$

Present Worth: To find P, given F

$(P/F, i, n)$ $$P = F(1+i)^{-n}$$

Series Compound Amount: To find F, given A

$(F/A, i, n)$ $$F = A\left[\frac{(1+i)^n - 1}{i}\right]$$

Sinking Fund: To find A, given F

$(A/F, i, n)$ $$A = F\left[\frac{i}{(1+i)^n - 1}\right]$$

Capital Recovery: To find A, given P

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

Series Present Worth: To find P, given A

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

Arithmetic Gradient Uniform Series: To find A, given G

$(A/G, i, n)$ $$A = G\left[\frac{(1+i)^n - in - 1}{i(1+i)^n - i}\right] \quad or \quad A = G\left[\frac{1}{i} - \frac{n}{(1+i)^n - 1}\right]$$

Arithmetic Gradient Present Worth: To find P, given G

$(P/G, i, n)$ $$P = G\left[\frac{(1+i)^n - in - 1}{i^2(1+i)^n}\right]$$

Geometric Gradient: To find P, given A_1, g

$(P/G, g, i, n)$ $$P = A_1\left[n(1+i)^{-1}\right]$$

when $i = g$

$$P = A_1\left[\frac{1-(1+g)^n(1+i)^{-n}}{i-g}\right]$$

when $i \neq g$

Continuous Compounding at Nominal Rate r

Single Payment: $$F = P\left[e^{rn}\right] \qquad P = F\left[e^{-rn}\right]$$

Uniform Series: $$A = F\left[\frac{e^r - 1}{e^{rn} - 1}\right] \qquad A = P\left[\frac{e^{rn}(e^r - 1)}{e^{rn} - 1}\right]$$

$$F = A\left[\frac{e^{rn} - 1}{e^{r} - 1}\right] \qquad P = A\left[\frac{e^{rn} - 1}{e^{rn}(e^{r} - 1)}\right]$$

Compound Interest

i = Interest rate per interest period.
n = Number of interest periods.
P = A present sum of money.
F = A future sum of money.
A = An end-of-period cash receipt or disbursement in a uniform series continuing for *n* periods.
G = Uniform period-by-period increase or decrease in cash receipts or disbursements.
g = Uniform rate of cash flow increase or decrease from period to period; the geometric gradient.
r = Nominal interest rate per interest period.
m = Number of compounding subperiods per period.

Effective Interest Rates

For non-continuous compounding: i_{eff} or $i_a = \left(1 + \frac{r}{m}\right)^{m} - 1$

where r = nominal interest rate per year
m = number of compounding periods in a year

OR

i_{eff} or $i_a = (1 + i)^{m} - 1$

where i = effective interest rate per period
m = number of compounding periods in a year

For continuous compounding: i_{eff} or $i_a = (e^{r}) - 1$

where r = nominal interest rate per year

Values of Interest Factors When n Equals Infinity

Single Payment:

$(F/P, i, \infty) = \infty$
$(P/F, i, \infty) = 0$

Uniform Payment Series:

$(A/F, i, \infty) = 0$ $(F/A, i, \infty) = \infty$
$(A/P, i, \infty) = i$ $(P/A, i, \infty) = 1$

Arithmetic Gradient Series:

$(A/G, i, \infty) = 1/i$
$(P/G, i, \infty) = 1/i^2$