Finance Formulas

\[ P = \text{principal or present value} \]
\[ M = \text{maturity value} \]
\[ A = \text{amount or future value} \]
\[ I = \text{interest amount} \]
\[ m = \text{number of compounding periods per year} \]
\[ i = \text{annual interest rate} \]
\[ t = \text{time (in years)} \]
\[ R = \text{periodic annuity payment} \]

\[ D = \text{discount amount} \]
\[ d = \text{discount rate} \]
\[ PR = \text{proceeds, amount to borrower} \]

\[ \frac{r}{m} = i = \text{interest rate per period} \]
\[ mt = n = \text{total number of compounding periods} \]

8.1 Simple Interest

\[ I = Prt \]
\[ A = P + I \]
\[ = P + Prt \]
\[ = P(1 + rt) \]

Simple Discount

\[ D = Mdt \]
\[ PR = M - D \]
\[ = M - Mdt \]
\[ = M(1 - dt) \]

8.2 Compound Interest

\[ A = P(1 + i)^n \]

Effective Rate

\[ x = (1 + i)^n - 1 \]

8.3 Ordinary Annuity (Future Value)

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

Ordinary Annuity Payment

\[ R = \frac{Ai}{(1 + i)^n - 1} \]

8.4 Present Value of an Annuity/Debt Payment

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

Balance of an Amortization

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