Chapter 6 Summary: Financial Formulas

Simple Interest: \( A = P + I = P + Prt \)

Discounted loan: \( R = L - Lrt = P - Prt \)

Compound Interest: \( A = P \left(1 + \frac{r}{m}\right)^{mt} = P(1 + i)^n \)

Effective Interest Rate, APR: \( APR = \left(1 + \frac{r}{m}\right)^m - 1 = (1 + i)^m - 1 \)

Future Value of an Annuity: \( A = p \left[ \frac{(1 + \frac{r}{m})^{mt} - 1}{\frac{r}{m}} \right] = p \left[ \frac{(1 + i)^n - 1}{i} \right] \)

Payments into a Sinking Fund: \( p = A \left[ \frac{\frac{r}{m}}{(1 + \frac{r}{m})^{mt} - 1} \right] = A \left[ \frac{i}{(1 + i)^n - 1} \right] \)

Present Value of an Annuity: \( P = p \left[ \frac{1 - (1 + \frac{r}{m})^{-mt}}{\frac{r}{m}} \right] = p \left[ \frac{1 - (1 + i)^{-n}}{i} \right] \)

Amount of Loan Payments Formula: \( p = P \left[ \frac{\frac{r}{m}}{1 - (1 + \frac{r}{m})^{-mt}} \right] = P \left[ \frac{i}{1 - (1 + i)^{-n}} \right] \)

Number of Payments to Retire a Loan: \( n = \frac{\ln \left( \frac{p}{p - P \left( \frac{r}{m} \right)} \right)}{\ln \left( 1 + \frac{r}{m} \right)} = \frac{\ln \left( \frac{p}{p - P \cdot i} \right)}{\ln(1 + i)} \)

Number of Payments to Reach an Investment Goal: \( n = mt = \frac{\ln \left( \frac{Ai + 1}{p} \right)}{\ln(1 + i)} \)