Financial Mathematics

Please Note: \( i = \frac{r}{m} \) and \( n = mt \) with
\( t \) = time in years,
\( r \) = interest rate expressed as a decimal,
\( m \) = number of compoundings per year,
\( FV \) = Future Value,
\( PV \) = Present Value,
\( PMT \) = Payment, and
\( I \) = Interest

Simple Interest: \( I = PVrt \) with \( FV = PV + I \)

Periodic Compounding: \( FV = PV (1 + i)^n = PV (1 + \frac{r}{m})^{mt} \)

Continuous Compounding: \( FV = PV e^{rt} \)

Annual Percentage Yield: \( APY = (1 + \frac{r}{m})^m - 1 \)

APY for Continuous Compounding: \( APY = e^r - 1 \)

Future value of an Ordinary Anuity: \( FV = PMT \left[ \frac{(1 + i)^n - 1}{i} \right] \)

Present value of an Ordinary Anuity: \( PV = PMT \left[ \frac{1 - (1 + i)^{-n}}{i} \right] \)

Remaining Balance after \( x \) payments: \( B = PMT \left[ \frac{1 - (1+i)^{-(n-x)}}{i} \right] \)