

Simple Interest

P = principal, F = future value, r = annual interest rate, t = number of years.

$$F = P(1 + rt).$$

Compound Interest

P = principal, F = future value, r = annual interest rate, t = number of years, k = number of compounding periods per year.

$$F = P \left(1 + \frac{r}{k} \right)^{kt}.$$

Effective Interest Rate (APY)

r = annual interest rate, k = number of compounding periods per year.

$$\text{APY} = \left(1 + \frac{r}{k} \right)^k - 1.$$

Annuities**Building Up**

F = future value, P = periodic deposit, r = annual interest rate, k = number of compounding periods per year, t = number of years.

$$F = P \left(\frac{\left(1 + \frac{r}{k} \right)^{kt} - 1}{r/k} \right).$$

If $k = 1$, then

$$F = P \left(\frac{(1 + r)^t - 1}{r} \right).$$

Drawing Down

P = annuity value, M = periodic withdrawal, r = annual interest rate, k = number of compounding periods per year, t = number of years.

$$M = P \left(\frac{r/k}{1 - \left(1 + \frac{r}{k}\right)^{-kt}} \right).$$

If $k = 1$, then

$$M = P \left(\frac{r}{1 - (1 + r)^{-t}} \right).$$

Installment Loans

P = principal, M = periodic payment, r = annual interest rate, k = number of compounding periods per year, t = number of years.

$$M = P \left(\frac{r/k}{1 - \left(1 + \frac{r}{k}\right)^{-kt}} \right).$$

If $k = 1$, then

$$M = P \left(\frac{r}{1 - (1 + r)^{-t}} \right).$$