Math 111 **Financial Formulas** **Fall 2017**

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 (APR)

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

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

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

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