Math 103 Formula Sheet

Financial Management

Simple Interest: $\text{Int} = Prt$

Future Value for Simple Interest: $FV = P(1 + rt)$

Future Value for Compound Interest: $FV = P\left(1 + \dfrac{r}{n}\right)^{nt}$

Present Value for Compound Interest: $P = \dfrac{FV}{\left(1 + \frac{r}{n}\right)^{nt}}$

Future Value for continuous compounding: $FV = Pe^{r \cdot t}$

Effective Annual Yield: $EAY = \left(1 + \dfrac{r}{n}\right)^{n} - 1$

Future Value of an Annuity (Pmt is the amount of each deposit): $FV = \dfrac{Pmt\left[\left(1 + \frac{r}{n}\right)^{nt} - 1\right]}{\left(\frac{r}{n}\right)}$

Periodic deposits for an Annuity (FV is the future value of the annuity): $Pmt = \dfrac{FV\left(\frac{r}{n}\right)}{\left[\left(1 + \frac{r}{n}\right)^{nt} - 1\right]}$

Periodic Mortgage Payments (B is the amount of mortgage): $Pmt = \dfrac{B\left(\frac{r}{n}\right)}{\left[1 - \left(1 + \frac{r}{n}\right)^{-nt}\right]}$

Probability and Counting Rules

Permutation rule: $_nP_k = \dfrac{n!}{(n-k)!}$

Combination rule: $_nC_k = \dfrac{n!}{(n-k)!\,k!}$

$P(\overline{E}) = 1 - P(E)$

$P(E) = 1 - P(\overline{E})$

$P(A \text{ or } B) = P(A) + P(B)$

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$P(A \text{ and } B) = P(A) \cdot P(B)$

$P(B \text{ given } A) = \dfrac{\text{number of common outcomes for B and A}}{\text{number of outcomes within A}}$

Statistics

Mean for individual data: $\overline{x} = \dfrac{\sum x}{n}$

Mean for grouped data: $\overline{x} = \dfrac{\sum f \cdot x_m}{n}$

Standard Deviation: $s = \sqrt{\dfrac{\sum(x - \overline{x})^2}{n - 1}}$

Z-score: $z = \dfrac{x - \overline{x}}{s}$

$\overline{x}$ = mean   x= data values $\sum$ = add all the values   f = frequency x_m= class or class midpoint   s = standard deviation