MATH 1332 Final Exam: Formula Sheet

$$\textit{absolute change} = \textit{new value} - \textit{reference value}$$

$$\textit{relative change} = \frac{\textit{new value} - \textit{reference value}}{\textit{reference value}} \times 100\%$$

$$\textit{absolute difference} = \textit{compared value} - \textit{reference value}$$

$$\textit{relative difference} = \frac{\textit{compared value} - \textit{reference value}}{\textit{reference value}} \times 100\%$$

$$\textit{final value} = (100 + P)\% \times \textit{initial value}$$

$$\textit{initial value} = \frac{\textit{final value}}{(100 + P)\%}$$

$$A = P \times (1 + APR)^{Y}$$

$$A = P \times \left(1 + \frac{APR}{n}\right)^{nY}$$

$$A = P \times e^{(APR \times Y)}$$

$$A = PMT \times \frac{\left[\left(1 + \frac{APR}{n}\right)^{nY} - 1\right]}{\left(\frac{APR}{n}\right)}$$

$$PMT = \frac{P \times \left(\frac{APR}{n}\right)}{\left[1 - \left(1 + \frac{APR}{n}\right)^{(-nY)}\right]}$$

$$\textit{total return} = \frac{(A - P)}{P} \times 100\%$$

$$\textit{annual return} = \left(\frac{A}{P}\right)^{\left(\frac{1}{Y}\right)} - 1$$

$$\textit{current yield} = \frac{\textit{annual interest payment}}{\textit{current price of bond}}$$

$$P(A) = \frac{\text{number of ways } A \text{ can occur}}{\text{total number of outcomes}}$$

$$P(\text{not } A) = 1 - P(A)$$

$$\text{odds for event } A = \frac{P(A)}{P(\text{not } A)}$$

$$\text{odds against event } A = \frac{P(\text{not } A)}{P(A)}$$

$$\begin{aligned} P(A \text{ and } B) &= P(A) \times P(B \text{ given } A) \\ &= P(A) \times P(B) \quad (\textit{independent events}) \end{aligned}$$

$$\begin{aligned} P(A \text{ or } B) &= P(A) + P(B) - P(A \text{ and } B) \\ &= P(A) + P(B) \quad (\textit{non-overlapping events}) \end{aligned}$$

$$P(\text{at least one event } A \text{ in } n \text{ trials}) = 1 - [P(\text{not } A)]^n$$

$$\text{expected value} = \begin{pmatrix}\text{event 1} \\ \text{value}\end{pmatrix} \times \begin{pmatrix}\text{event 1} \\ \text{probability}\end{pmatrix} + \begin{pmatrix}\text{event 2} \\ \text{value}\end{pmatrix} \times \begin{pmatrix}\text{event 2} \\ \text{probability}\end{pmatrix}$$

$${}_nP_r = \frac{n!}{(n-r)!}$$

$${}_nC_r = \frac{n!}{(n-r)! \times r!}$$

$$\textit{relative frequency} = \frac{\textit{frequency in category}}{\textit{total frequency}}$$

$$\textit{cumulative frequency} = \frac{\textit{frequency in category and all preceding categories}}{\textit{total frequency}}$$

$$\textit{95\% confidence interval} = \textit{from (sample statistic} - \textit{margin of error)}$$
$$\textit{to (sample statistic} + \textit{margin of error)}$$

$$mean = \frac{sum\ of\ all\ values}{total\ number\ of\ values}$$

$$range = highest\ value - lowest\ value$$

$$standard\ deviation = \sqrt{\frac{sum\ of\ (deviations\ from\ the\ mean)^2}{total\ number\ of\ data\ values - 1}}$$

$$standard\ deviation \approx \frac{range}{4}$$

$$lowest\ value \approx mean - (2 \times standard\ deviation)$$

$$highest\ value \approx mean + (2 \times standard\ deviation)$$

$$growth\ rate = birth\ rate - death\ rate$$

$$logistic\ growth\ rate = r \times \left(1 - \frac{population}{carrying\ capacity}\right)$$

$$rate\ of\ change = slope = \frac{change\ in\ dependent\ variable}{change\ in\ independent\ variable}$$

$$slope = \frac{change\ in\ y}{change\ in\ x}$$

$$change\ in\ dependent\ variable = \begin{pmatrix}\text{rate of}\\ \text{change}\end{pmatrix} \times \begin{pmatrix}\text{change in}\\ \text{independent variable}\end{pmatrix}$$

$$dependent\ variable = initial\ value + (rate\ of\ change \times independent\ variable)$$

$$Q = Q_0 \times (1 + r)^t$$

$$T_{double} = \frac{\log_{10} 2}{\log_{10}(1 + r)} \qquad (r > 0)$$

$$T_{double} \approx \frac{70}{P}$$

$$new\ value = initial\ value \times 2^{t/T_{double}}$$

$$T_{half} = -\frac{\log_{10} 2}{\log_{10}(1 + r)} \qquad (r < 0)$$

$$T_{half} \approx \frac{70}{P}$$

$$new\ value = initial\ value \times \left(\frac{1}{2}\right)^{t/T_{half}}$$