Final-Exam-Friendly Formula Sheet

Confidence Intervals

		Confidence Level C		
Estimate	**Formula**	**90%**	**95%**	**99%**
Population Mean (σ Known)	$\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}}$	$z^* = 1.645$	$z^* = 1.960$	$z^* = 2.576$
Population Mean (σ Unknown)	$\bar{x} \pm t^* \frac{s}{\sqrt{n}}$	Use Table B	Use Table B	Use Table B
Population Proportion	$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	$z^* = 1.645$	$z^* = 1.960$	$z^* = 2.576$
Population Proportion (Plus Four)	$\tilde{p} \pm z^* \sqrt{\frac{\tilde{p}(1-\tilde{p})}{n+4}}$ $\tilde{p} = \frac{s+2}{n+4}$	$z^* = 1.645$	$z^* = 1.960$	$z^* = 2.576$

Sample Size n for Desired Margin of Error m at Confidence Level $C\%$

$$n = \left(\frac{z^*}{m}\right)^2 p^*(1-p^*)$$

where p^* is a reasonable guess of p. If unsure, use $p^* = 0.5$. z^* is the critical value associated with $C\%$ confidence, and m is the desired margin of error expressed as a decimal.

Tests of Significance

		Significance Level α		
Test	**Test Statistic**	**0.1**	**0.05**	**0.01**
Population Mean (σ Known)	$z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$	$z^* = 1.645$	$z^* = 1.960$	$z^* = 2.576$
Population Mean (σ Unknown)	$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$	Use Table B	Use Table B	Use Table B
Population Proportion	$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$	$z^* = 1.645$	$z^* = 1.960$	$z^* = 2.576$
Two Population Means (σ Unknown)	$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$	Use Table B	Use Table B	Use Table B
Two Population Proportions	$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$ $\hat{p} = \frac{\text{combined successes of both groups}}{n_1 + n_2}$	$z^* = 1.645$	$z^* = 1.960$	$z^* = 2.576$