

Formula Sheet for Exam #2
POS 3713 - Spring 2007 (Dr. Hensel)

Note about notation: \bar{X} on this sheet is the same as Xbar in lecture notes

Descriptive Statistics

Proportion: $p = f / N$ (where f =frequency of cases in this category, and N =total sample size)

Percentage (%) = $(f/N) * 100$

Ratio = $f1 / f2$ (where $f1$ and $f2$ are the frequency of cases in each category)

Rate = actual / possible (often multiplied by 100, 1000, etc. to help interpret)

Percentage change = $([f2-f1] / f1) * 100$ (where $f1$ =the earlier value and $f2$ =the later value)

Mean: $\bar{X} = \frac{\sum X_i}{N}$ (where X_i refers to the individual observations and N =sample size)

IQV = $\frac{k(N^2 - \sum f^2)}{N^2(k-1)}$ (where k = # categories, f^2 = sum of frequencies squared, N =sample size)

Deviation = $X_i - \bar{X}$

Sum of Squares/Sum of Squared Deviations = $\sum (X_i - \bar{X})^2$

Variance: $\sigma^2 = \text{SSD}/N = \frac{\sum (X_i - \bar{X})^2}{N}$

Standard deviation: $\sigma = \sqrt{\sigma^2}$

Std error of mean = std dev of sampling dist. = $\frac{\sigma}{\sqrt{N}}$ (where σ =std dev of pop, N =sample size)

Z-scores

$Z = \frac{X_i - \bar{X}}{s}$ (where X_i =score, \bar{X} =variable mean, s =variable std dev)

Inferential Statistics

Confidence interval for the mean = $\bar{X} \pm Z_{\alpha/2} * (\frac{\sigma}{\sqrt{N}})$

(where \bar{X} = sample mean, $Z_{\alpha/2}$ = Z-score for two-tailed test, σ = population std dev.; for 95% confidence level $\alpha=.05$, $\alpha/2=.025$, and $Z_{\alpha/2}=1.96$; as long as $N>100$ can substitute sample std dev, s , for σ if σ unknown)

Confidence interval for the proportion = $P_s \pm Z_{\alpha/2} * \sqrt{\frac{(P_u * (1 - P_u))}{N}}$

(where P_s = sample proportion, P_u = population proportion; set $P_u = .5$ unknown; for 95% confidence level $\alpha=.05$, $\alpha/2=.025$, and $Z_{\alpha/2}=1.96$)

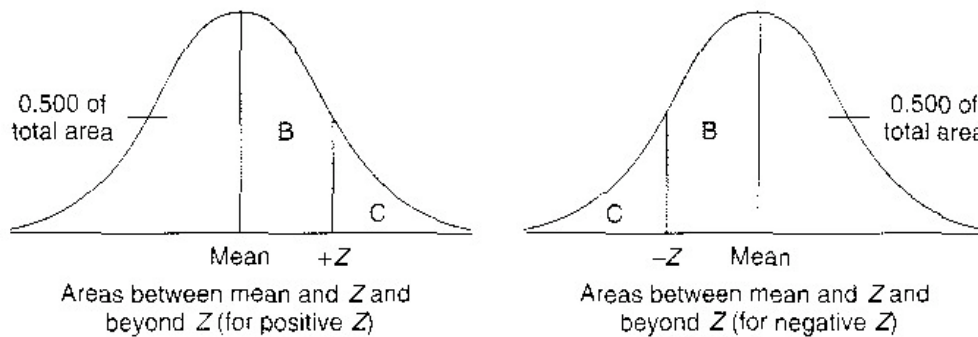
Hypothesis test for the sample mean (1-sample): $Z \text{ (obtained)} = \frac{\bar{X} - \mu}{\sigma / \sqrt{N}}$

(where \bar{X} =sample mean, μ = pop. mean, $[\sigma / \sqrt{N}]$ =std error of mean)

Appendix B

The Standard Normal Table

The values in column A are Z scores. Column B lists the proportion of area between the mean and a given Z . Column C lists the proportion of area beyond a given Z . Only positive Z scores are listed. Because the normal curve is symmetrical, the areas for negative Z scores will be exactly the same as the areas for positive Z scores.



Column A	Column B	Column C
Z	Area between Mean and Z	Area beyond Z
0.00	0.0000	0.5000
2.00	0.4772	0.0228
4.00	0.4999	<0.0001

(This will be expanded by the time of the exam, and it will include all the numbers you will need for the test)