Exam #3 Equation Sheet

Interval Estimation for:

the population mean $P(\ldots \leq \mu \leq \cdots) = 1 - \alpha$

Where σ is known

Must have a large sample if the population is not normally distributed

May have a small sample if the population is normally distributed

$\bar{x} \pm Z\sigma_{\bar{x}}$ $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

Where the population is not normally distributed, unknown σ, must have a large sample size

$\bar{x} \pm ZS_{\bar{x}}$ $s_{\bar{x}} = \frac{s}{\sqrt{n}}$

Where the population is normally distributed, unknown σ, may have a small sample size

$\bar{x} \pm t\, S_{\bar{x}}$ $s_{\bar{x}} = \frac{s}{\sqrt{n}}$

the population proportion, large sample size $P(\ldots \leq \rho \leq \cdots) = 1 - \alpha$

$\bar{\rho} \pm ZS_{\bar{\rho}}$ $s_{\bar{\rho}} = \sqrt{\frac{\bar{\rho}(1-\bar{\rho})}{n}}$

the difference between two population means $P(\ldots \leq \mu_1 - \mu_2 \leq \cdots) = 1 - \alpha$

Large sample size for both populations, unknown and unequal population variances

$(\bar{x}_1 - \bar{x}_2) \pm ZS_{\bar{x}_1 - \bar{x}_2}$ $S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$

the difference between two population proportions $P(\ldots \leq \rho_1 - \rho_2 \leq \cdots) = 1 - \alpha$

Large sample size for both populations

$(\bar{\rho}_1 - \bar{\rho}_2) \pm ZS_{\bar{\rho}_1 - \bar{\rho}_2}$ $S_{\bar{\rho}_1 - \bar{\rho}_2} = \sqrt{\frac{\bar{\rho}_1(1-\bar{\rho}_1)}{n_1} + \frac{\bar{\rho}_2(1-\bar{\rho}_2)}{n_2}}$

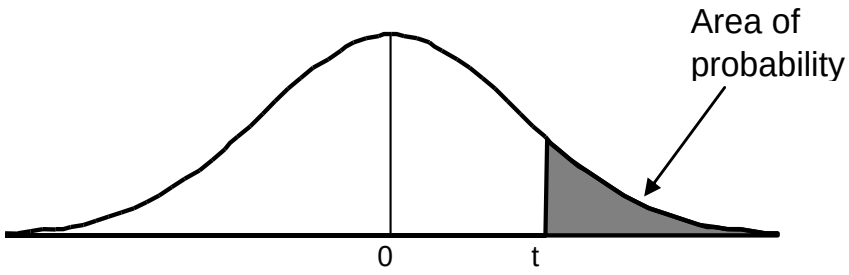
Sample size for estimating

the population mean $n = \frac{Z^2\sigma^2}{E^2}$

the population proportion $n = \frac{Z^2\rho(1-\rho)}{E^2}$

Sample Variance $s^2 = \frac{n\sum x_i^2 - (\sum x_i)^2}{n(n-1)}$

T Distribution



Degrees of Freedom	Area in Upper Tail					
	0.20	**0.10**	**0.05**	**0.025**	**0.01**	**0.005**
1	1.376	3.078	6.314	12.706	31.821	63.657
2	1.061	1.886	2.920	4.303	6.965	9.925
3	0.978	1.638	2.353	3.182	4.541	5.841
4	0.941	1.533	2.132	2.776	3.747	4.604
5	0.920	1.476	2.015	2.571	3.365	4.032
6	0.906	1.440	1.943	2.447	3.143	3.707
7	0.896	1.415	1.895	2.365	2.998	3.499
8	0.889	1.397	1.860	2.306	2.896	3.355
9	0.883	1.383	1.833	2.262	2.821	3.250
10	0.879	1.372	1.812	2.228	2.764	3.169
11	0.876	1.363	1.796	2.201	2.718	3.106
12	0.873	1.356	1.782	2.179	2.681	3.055
13	0.870	1.350	1.771	2.160	2.650	3.012
14	0.868	1.345	1.761	2.145	2.624	2.977
15	0.866	1.341	1.753	2.131	2.602	2.947
16	0.865	1.337	1.746	2.120	2.583	2.921
17	0.863	1.333	1.740	2.110	2.567	2.898
18	0.862	1.330	1.734	2.101	2.552	2.878
19	0.861	1.328	1.729	2.093	2.539	2.861
20	0.860	1.325	1.725	2.086	2.528	2.845
21	0.859	1.323	1.721	2.080	2.518	2.831
22	0.858	1.321	1.717	2.074	2.508	2.819
23	0.858	1.319	1.714	2.069	2.500	2.807
24	0.857	1.318	1.711	2.064	2.492	2.797
25	0.856	1.316	1.708	2.060	2.485	2.787
26	0.856	1.315	1.706	2.056	2.479	2.779
27	0.855	1.314	1.703	2.052	2.473	2.771
28	0.855	1.313	1.701	2.048	2.467	2.763
29	0.854	1.311	1.699	2.045	2.462	2.756
30	0.854	1.310	1.697	2.042	2.457	2.750
40	0.851	1.303	1.684	2.021	2.423	2.704
60	0.848	1.296	1.671	2.000	2.390	2.660
80	0.846	1.292	1.664	1.990	2.374	2.639
∞	0.842	1.282	1.645	1.960	2.326	2.576