Inference Formulas & Conditions

z-Procedures

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
1-Proportion z-Interval				
	Interval			

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
1-Proportion z-Test				
	Null Hypothesis		Test Statistic	

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
2-Proportion z-Interval				
	Interval			

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
2-Proportion z-Test				
	Null Hypothesis		Test Statistic	

t-Procedures

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
1-Sample t-Interval				
	Interval			

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
1-Sample t-Test				
	Null Hypothesis		Test Statistic	

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
2-Sample t-Interval				
	Interval			

Procedure	Parameter	Estimate	SE(Estimate)	Conditions
2-Sample t-Test				
	Null Hypothesis		Test Statistic	

t-Procedures (continued)

<table>
<tr><th>Procedure</th><th>Parameter</th><th>Estimate</th><th>SE(Estimate)</th><th>Conditions</th></tr>
<tr><td rowspan="3">Paired
t-Interval</td><td></td><td></td><td></td><td rowspan="3"></td></tr>
<tr><th colspan="3">Interval</th></tr>
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χ^2 -Procedures

Procedure	Null Hypothesis	Conditions
Chi-Square-Test for Goodness-of-Fit		
	Test Statistic	

Procedure	Null Hypothesis	Conditions
Chi-Square-Test of Homogeneity		
	Test Statistic	

Procedure	Null Hypothesis	Conditions
Chi-Square-Test of Independencet		
	Test Statistic	

Inference Formulas & Conditions

Situation	Confidence Interval	Significance Test	Conditions
1 mean (**σ known**)	$\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}}$ TI-83+ ZInterval	$H_o: \mu = \mu_o$ $Z = \frac{\bar{x} - \mu_o}{\frac{\sigma}{\sqrt{n}}}$ TI-83+ Z-Test	1. SRS 2. population size ≥ 10n 3. population is normal **or** large sample size (n ≥ 40)
1 mean (**σ not known**) **or** **2 means** **(matched pairs)**	$\bar{x} \pm t^*_{n-1} \frac{s}{\sqrt{n}}$ TI-83+ TInterval	$H_o: \mu = \mu_o$ $t = \frac{\bar{x} - \mu_o}{\frac{s}{\sqrt{n}}}$ TI-83+ T-Test	1. SRS 2. population size ≥ 10n 3. population is normal **or** large sample size (n ≥ 40) **or** moderate sample size (15≤ n ≤ 40) with moderate skewness or outliers
2 means **(independent)**	$(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$ TI-83+ 2-SampTInt	$H_o: \mu_1 = \mu_2$ $t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$ TI-83+ 2-SampTTest	1. SRS 2. population size ≥ 10n 3. population is normal **or** large sample size ($(n_1 + n_2) \geq 40$) **or** moderate sample size ($15 \leq (n_1 + n_2) \leq 40$) with moderate skewness or outliers 4. independently chosen samples

Inference Formulas & Conditions

Situation	Confidence Interval	Significance Test	Conditions
1 proportion	$\hat{p} \pm z^* \sqrt{\frac{\hat{p}\hat{q}}{n}}$ **TI-83+ 1-PropZInt**	H_o: $p = p_0$ $z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}}$ **TI-83+ 1-PropZTest**	1. SRS 2. population size ≥ 10n 3. **ST**: $np_0 \geq 10$ & $nq_0 \geq 10$ **CI**: $n\hat{p} \geq 10$ & $n\hat{q} \geq 10$
2 proportions	$(\hat{p}_1 - \hat{p}_2) \pm z^* \sqrt{\frac{\hat{p}_1\hat{q}_1}{n_1} + \frac{\hat{p}_2\hat{q}_2}{n_2}}$ **TI-83+ 2-PropZInt**	H_o: $p_1 = p_2$ $z = \frac{(\hat{p}_1 - \hat{p}_2)}{\sqrt{\hat{p}\hat{q}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$ **TI-83+ 2-PropZTest**	1. SRS 2. population size ≥ 10n 3. independently chosen samples 4. **ST**: $n_1\hat{p} \geq 5$ & $n_1\hat{q} \geq 5$ & $n_2\hat{p} \geq 5$ & $n_2\hat{q} \geq 5$ **CI**: $n_1\hat{p}_1 \geq 5$ & $n_1\hat{q}_1 \geq 5$ & $n_2\hat{p}_2 \geq 5$ & $n_2\hat{q}_2 \geq 5$
More than 2 Proportions **Two-Way Table**		H_o: All of the proportions are the same. $X^2 = \sum \frac{(O - E)^2}{E}$ df = (r–1)(c–1) r = rows, c = columns **TI-83+ χ^2-Test**	1. SRS 2. independently chosen samples 3. all expected counts are ≥ 5

Inference Formulas & Conditions

Situation	Confidence Interval	Significance Test	Conditions
More than 2 Proportions **One-Way Table** **Goodness of Fit**		H_o: All of the proportions are the same. $X^2 = \sum \frac{(O-E)^2}{E}$ df = n – 1	1. SRS 2. independently chosen samples 3. all expected counts are ≥ 5
Regression Slope **($\mu y = \alpha + ßx$)**	$b \pm SE_b$ $SE_b = \frac{\sqrt{\frac{1}{n-2}\sum(y-\hat{y})^2}}{\sqrt{\sum(x-\bar{x})^2}}$	H_o: ß = 0 $t = \frac{b}{SE_b}$ **TI-83+ LinRegTTest**	1. y responses are independent[1] 2. true relationship is linear 3. standard deviation about the true regression line is constant 4. response varies normally

[1] Repeated observations on the same individual are not allowed.