Confidence Intervals

	Mean		Proportion	Two Means
	σ Known	σ Unknown		
Formula	$(\bar{x} - E, \bar{x} + E)$	$(\bar{x} - E, \bar{x} + E)$	$(\hat{p} - E, \hat{p} + E)$	$((\overline{x_1} - \overline{x_2}) - E, (\overline{x_1} - \overline{x_2}) + E)$
Calculator Function	ZInterval	TInterval	1-PropZInt	2-SampZInt
Margin of Error	$E = z_{\frac{\alpha}{2}}(\frac{\sigma}{\sqrt{n}})$	$E = t_{\frac{\alpha}{2}}(\frac{s}{\sqrt{n}})$	$E = z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	$E = z_{\alpha/2}\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$
Sample Size	$n = (\frac{z_{\alpha/2} * \sigma}{E})^2$	N/A	$n = p(1-p)(\frac{z_{\alpha/2}}{E})^2$	N/A
Critical Value	$z_{\alpha/2}$	$t_{\alpha/2}$	$z_{\alpha/2}$	$z_{\alpha/2}$
Requirements	• n ≥ 30 • Approximately Normal	• n ≥ 30 • Approximately Normal	• np ≥ 10 • n(1-p)≥10 • Approximately Normal	• $n_1 \geq 30 \; and \; n_2 \geq 30$ • Both Populations Approximately Normal
Key Phrases	• Interval • Endpoints • Mean • Population Standard Deviation Known	• Interval • Endpoints • Mean • Population Standard Deviation Unknown • Sample Standard Deviation	• Interval • Endpoints • Proportion	• Interval • Endpoints • Difference Between Two Means • Population Standard Deviation Known
Extra Equations	• $E = \frac{upper\ endpoint - lower\ endpoint}{2}$ • $\mu = \frac{upper\ end\ point + lower\ endpoint}{2}$		• $E = \frac{upper - lower}{2}$ • $p = \frac{upper + lower}{2}$ • $x = \hat{p} * n$	• $E = \frac{upper - lower}{2}$ • $\mu_1 - \mu_2 = \frac{upper + lower}{2}$

Critical Value Calculations

	Z Interval	T Interval		Proportion Interval	2 Sample Z Interval
Symbol	$z_{\frac{\alpha}{2}}$	$t_{\frac{\alpha}{2}}$		$z_{\frac{\alpha}{2}}$	$z_{\frac{\alpha}{2}}$
General	• 2nd > Vars • invNorm	• Stat > Tests • 8: TInterval • Stat	• 2nd > Vars • invT	Same as Z Interval	Same as Z Interval
Ti-83	$\left(\frac{1-c}{2}\right), 0, 1$	• $\bar{x}$: 0 • Sx: $\sqrt{n}$ • n: Sample Size • C-Level: c	N/A		
Ti-84	• Area: $\frac{1-c}{2}$ • Mean: 0 • SD: 1		• Area: $\frac{1-c}{2}$ • DF: n – 1		

Endpoint Calculations

	Z Interval	T Interval	Proportion Interval	2 Sample Z Interval
General	• Stat > Tests • 7: ZInterval • Stat if Numbers • Data if List (Stat > Edit)	• Stat > Tests • 8: TInterval • Stat if Numbers • Data if List (Stat > Edit)	• Stat > Tests • A: 1-PropZInt	• Stat > Tests • 9: 2-SampZInt • Stat if Numbers • Data if Lists (Stat > Edit)
Calculator Input	• σ: Population SD • $\bar{x}$: Sample Mean • n: Sample Size • C-Level: c	• $\bar{x}$: Sample Mean • Sx: Sample SD • n: Sample Size • C-Level: c	• x: Number of Successes • n: Sample Size • C-Level: c	• σ1: Population SD Group 1 • σ2: Population SD Group 2 • $\bar{x}1$: Sample Mean Group 1 • n1: Sample Size Group 1 • $\bar{x}2$: Sample Mean Group 2 • n2: Sample Size Group 2 • C-Level: c

Hypothesis Tests

	Mean		Proportion	Two Means
	σ Known	σ Unknown		
Calculator Function	Z-Test	T-Test	1-PropZTest	2-SampZTest
Alternative Hypotheses	• $u \neq u$ • $u < \mu$ • $\mu > \mu$	• $u \neq u$ • $u < \mu$ • $\mu > \mu$	• $p \neq p$ • $p < p$ • $p > p$	• $\mu_1 \neq \mu_2$ • $\mu_1 < \mu_2$ • $\mu_1 > \mu_2$
Test Statistic	$z = \frac{\bar{x} - \mu}{(\frac{\sigma}{\sqrt{n}})}$	$t = \frac{\bar{x} - \mu}{(\frac{s}{\sqrt{n}})}$	$z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}}$	$z = \frac{(\overline{x_1} - \overline{x_2}) - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$
Requirements	• n ≥ 30 • Approximately Normal	• n ≥ 30 • Approximately Normal	• np ≥ 10 • n(1-p)≥10 • Approximately Normal	• $n_1 \geq 30 \; and \; n_2 \geq 30$ • Both Populations Approximately Normal
Key Phrases	• Test • Claim • Sufficient Evidence • Mean • Population Standard Deviation Known	• Test • Claim • Sufficient Evidence • Mean • Population Standard Deviation Unknown • Sample Standard Deviation	• Test • Claim • Sufficient Evidence • Proportion	• Test • Claim • Sufficient Evidence • Difference Between Two Means • Population Standard Deviation Known
Conclusions	$p - value \leq \alpha$	Reject the null hypothesis. There is sufficient evidence to support the alternative hypothesis.		
	$p - value > \alpha$	Do not reject the null hypothesis. There is not sufficient evidence to support the alternative hypothesis.		

Test Calculations				
	Z Test	T Test	Proportion Test	2 Sample Z Test
General	• Stat > Tests • 1: Z-Test • Stat if Numbers • Data if List (Stat > Edit)	• Stat > Tests • 2: T-Test • Stat if Numbers • Data if List (Stat > Edit)	• Stat > Tests • 5: 1-PropZTest	• Stat > Tests • 3: 2-SampZTest • Stat if Numbers • Data if Lists (Stat > Edit)
Calculator Input	• μ_0: Null Hypothesis • σ: Population SD • $\bar{x}$: Sample Mean • n: Sample Size • μ: $\neq \mu_0 < \mu_0 > \mu_0$ Alternative Hypothesis	• μ_0: Null Hypothesis • $\bar{x}$: Sample Mean • Sx: Sample SD • n: Sample Size • μ: $\neq \mu_0 < \mu_0 > \mu_0$ Alternative Hypothesis	• p_0: Null Hypothesis • x: Number of Successes • n: Sample Size • $prop$: $\neq p_0 < p_0 > p_0$ Alternative Hypothesis	• σ1: Population SD Group 1 • σ2: Population SD Group 2 • $\bar{x}1$: Sample Mean Group 1 • n1: Sample Size Group 1 • $\bar{x}2$: Sample Mean Group 2 • n2: Sample Size Group 2 • $\mu 1$: $\neq \mu 2 < \mu 2 > \mu 2$ Alternative Hypothesis