Test Statistic

	Population or Known Standard Deviation	Sample Standard Deviation	Proportion
One-sample	$Z=\frac{\bar{x}-\mu}{\frac{\sigma}{\sqrt{n}}}$	$t=\frac{\bar{x}-\mu}{\frac{s}{\sqrt{n}}}$	$Z=\frac{\hat{p}-p}{\sqrt{\frac{p(1-p)}{n}}}$
Two-sample	$Z=\frac{(\bar{x}_1-\bar{x}_2)-(\mu_1-\mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1}+\frac{\sigma_2^2}{n_2}}}$	$t=\frac{(\bar{x}_1-\bar{x}_2)-(\mu_1-\mu_2)}{\sqrt{s^2_{pooled}(\frac{1}{n_1}+\frac{1}{n_2})}}$	$Z=\frac{(\hat{p}_1-\hat{p}_2)-(p_1-p_2)}{\sqrt{\bar{p}(1-\bar{p})(\frac{1}{n_1}+\frac{1}{n_2})}}$
Paired-sample	-	$t=\frac{\bar{D}-\mu_D}{\frac{s_D}{\sqrt{n}}}$	-

Confidence Interval

Population or Known Standard Deviation	Sample Standard Deviation	Proportion
$\mu \le \bar{x} \pm Z_{\frac{\alpha}{2}}(\frac{\sigma}{\sqrt{n}})$	$\mu \le \bar{x} \pm t_{n-1,\frac{\alpha}{2}}(\frac{s}{\sqrt{n}})$	$p \le \hat{p} \pm Z_{\frac{\alpha}{2}}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

Hypothesis Testing

	Non-proportion value	Proportion value
One-sample (different)	$H_0:\mu=10$; $H_1:\mu\neq10$	$H_0:p=0.2$; $H_1:p\neq0.2$
One-sample (less than)	$H_0:\mu\geq10$; $H_1:\mu<10$	$H_0:p\geq0.2$; $H_1:p<0.2$
One-sample (greater than)	$H_0:\mu\leq10$; $H_1:\mu>10$	$H_0:p\leq0.2$; $H_1:p>0.2$
Two-sample(different)	$H_0:\mu_1=\mu_2$; $H_1:\mu_1\neq\mu_2$	$H_0:p_1=p_2$; $H_1:p_1\neq p_2$
Two-sample(less than)	$H_0:\mu_1\geq\mu_2$; $H_1:\mu_1<\mu_2$	$H_0:p_1\geq p_2$; $H_1:p_1<p_2$
Two-sample(greater than)	$H_0:\mu_1\leq\mu_2$; $H_1:\mu_1>\mu_2$	$H_0:p_1\leq p_2$; $H_1:p_1>p_2$
Paired-sample(different)	$H_0:\mu_D=0$; $H_1:\mu_D\neq0$	
Paired-sample(less than)	$H_0:\mu_D\geq0$; $H_1:\mu_D<0$	
Paired-sample(greater than)	$H_0:\mu_D\leq0$; $H_1:\mu_D>0$	-

critical values using TI-83

	One-tailed test	Two-tailed test
One sample from a normal distribution with known σ	Given α, find z = **invnorm(**α**)**.	Given α, find z = **invnorm(**α/2).
Two sample from a normal distribution with known σ	Given α, find z = **invnorm(**α).	Given α, find z = **invnorm(**α/2).
One sample from a distribution with an unknown σ	**Math/solver/tcdf(L,U,D)-A** where L= -9999 U= solution (critical value) D= degrees of freedom=n-1 A= level of significance=α	**Math/solver/tcdf(L,U,D)-A** where L= -9999 U= solution (critical value) D= degrees of freedom=n-1 A= level of significance=α/2
Two sample from a distribution with an unknown σ	**Math/solver/tcdf(L,U,D)-A** where L= -9999 U= solution (critical value) D= degrees of freedom=n1+n2-2 A= level of significance=α	**Math/solver/tcdf(L,U,D)-A** where L= -9999 U= solution (critical value) D= degrees of freedom=n1+n2-2 A= level of significance=α/2
p_value	Given z, find p_value = **normalcdf(z, 9999)**.	Given z, find p_value = **2 * normalcdf(z, 9999)**.

Decision Making

	Critical value	P_value
z table	If $\|z\| > z_{\alpha}$ reject H_0, there is evidence that.......; else do NOT reject H_0, there is no evidence that.......	If p_value < α reject H_0, there is evidence that.......; else do NOT reject H_0, there is no evidence that.......
t table	If $\|t\| > t_{n-1,\{\alpha,\alpha/2\}}$ reject H_0, there is evidence that.......; else do NOT reject H_0, there is no evidence that.......	If p_value < α reject H_0, there is evidence that.......; else do NOT reject H_0, there is no evidence that.......