Confidence Interval Formula Sheet

	Case 1	Case 2	Case 3	Case 4
Dist	Normal	General	General	Binomial
# observations	Anything	Large	Large	Large
μ	?	?	?	?
σ^2	Known	Known	?	?
Statistic	$\frac{\bar{X}-\mu}{\sigma/\sqrt{n}}$	$\frac{\bar{X}-\mu}{\sigma/\sqrt{n}}$	$\frac{\bar{X}-\mu}{s/\sqrt{n}}$	$(\frac{x}{n}-p)\Big/\sqrt{\frac{p(1-p)}{n}}$
CI	$\bar{x} \pm z_{\alpha/2}\cdot\frac{\sigma}{\sqrt{n}}$	$\bar{x} \pm z_{\alpha/2}\cdot\frac{\sigma}{\sqrt{n}}$	$\bar{x} \pm z_{\alpha/2}\cdot\frac{s}{\sqrt{n}}$	$\frac{x}{n} \pm z_{\alpha/2}\cdot\sqrt{\frac{\frac{x}{n}(1-\frac{x}{n})}{n}}$ $\hat{p}=\frac{x}{n}$

	Case 5	Case 6 (one sided)	Case 6 (two sided)
Dist	Normal	• Estimate population standard deviation	• Estimate σ^2 (variance)
# observations	Anything	• Upper bound only (change $\alpha/2 \Rightarrow \alpha$)	• To estimate σ, take root of results
μ	?		$\left[\frac{(n-1)s^2}{\chi^2_{\alpha/2,n-1}}, \frac{(n-1)s^2}{\chi^2_{1-\alpha/2,n-1}}\right] \Rightarrow \sigma^2$
σ^2	?		$\left[\sqrt{\frac{(n-1)s^2}{\chi^2_{\alpha/2,n-1}}}, \sqrt{\frac{(n-1)s^2}{\chi^2_{1-\alpha/2,n-1}}}\right] \Rightarrow \sigma$
Statistic	$\frac{\bar{x}-\mu}{s/\sqrt{n}} = T$ $t_{\alpha,\nu}$: $\nu = n-1$ deg. freedom		
CI	$\bar{x} \pm t_{\frac{\alpha}{2};n-1}\cdot\frac{s}{\sqrt{n}}$	$\sqrt{\frac{(n-1)s^2}{\chi^2_{1-\alpha,n-1}}}$	