Formulas associated with some common one-sample and two-sample inference problems:

Inference for	Sample Size	Assumptions	Interval	Hypothesis Test	Note
μ (one mean)	large n		$\bar{x} \pm z\frac{s}{\sqrt{n}}$	$H_0 : \mu = \#$ $Z = \frac{\bar{x}-\#}{\frac{s}{\sqrt{n}}}$ ... is std Normal (under H_0)	use σ instead of s if known
	small n	Observations Normal and σ unknown	$\bar{x} \pm t\frac{s}{\sqrt{n}}$	$H_0 : \mu = \#$ $T = \frac{\bar{x}-\#}{\frac{s}{\sqrt{n}}}$ is t with df $\nu = n-1$ (under H_0)	If σ known, std normal will be used
x_{n+1} (a single additional observation)		Observations Normal	$\bar{x} \pm ts\sqrt{1+\frac{1}{n}}$		t as above
$\mu_1 - \mu_2$ (difference between 2 means)	large n_1, n_2	**Independent** Samples	$\bar{x_1} - \bar{x_2}$ $\pm z\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}$	$H_0 : \mu_1 - \mu_2 = \#$ $Z = \frac{\bar{x_1}-\bar{x_2}-\#}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}}$ ... is std Normal (under H_0)	use σ's instead of s's if known
	small n_1 or n_2	**Independent** Samples and Normal Obs. and $\sigma_1 = \sigma_2$ (unknown)	$\bar{x_1} - \bar{x_2}$ $\pm ts_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}$ $s_p^2 = \frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{n_1+n_2-2}$	$H_0 : \mu_1 - \mu_2 = \#$ $T = \frac{\bar{x_1}-\bar{x_2}-\#}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$ ... is t with df $\nu = n_1 + n_2 - 2$ (under H_0)	
$\mu_1 - \mu_2$ (difference between 2 means) ($\mu_d = \mu_1 - \mu_2$)	large n ($n = n_1 = n_2$)	**Dependent (paired)** Samples	$\bar{d} \pm z\frac{s_d}{\sqrt{n}}$ $d = x_1 - x_2$ is difference data	$H_0 : \mu_d = \#$ $Z = \frac{\bar{d}-\#}{\frac{s_d}{\sqrt{n}}}$ ... is std Normal (under H_0)	Formulas match one mean case - but in terms of difference data (d)
	small n ($n = n_1 = n_2$)	**Dependent (paired)** Samples and differences Normal	$\bar{d} \pm t\frac{s_d}{\sqrt{n}}$	$H_0 : \mu_d = \#$ $T = \frac{\bar{d}-\#}{\frac{s_d}{\sqrt{n}}}$ ... is t with df $\nu = n-1$ (under H_0)	