Mean (with KNOWN population standard deviation σ—NOT VERY LIKELY, SEE NEXT PAGE)	One sample	Confidence interval	One-sample z interval	• $\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}}$	• SRS • Standard deviation of the population σ is known • Normal population OR n ≥ 30 • n ≤ 1/10 N
		Significance test	One-sample z test	• H_0: $\mu = \mu_0$ (a constant) • z = $\frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$	• SRS • Standard deviation of the population σ is known • Normal population OR n ≥ 30 • n ≤ 1/10 N
	Two sample	Confidence interval	Two-sample z interval	• $(\bar{x}_1 - \bar{x}_2) \pm z^* \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$	• Independent SRSs from each population • Normal population OR n ≥ 30 OR graph of sample data shows no strong skewness and no outliers for each sample • n ≤ 1/10 N for each sample
		Significance test	Two-sample z test	• H_0: $\mu = \mu_0$ (a constant) • z = $\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$	• Independent SRSs from each population • Normal population OR n ≥ 30 OR graph of sample data shows no strong skewness and no outliers for each sample • n ≤ 1/10 N for each sample

Mean (with UNKNOWN population standard deviation σ)	One sample	Confidence interval	One-sample t interval	• $\bar{x} \pm t^* \frac{s}{\sqrt{n}}$ • Degrees of freedom = n - 1	• SRS • Normal population OR n ≥ 30 OR graph of sample data shows no strong skewness and no outliers • n ≤ 1/10 N
		Significance test	One-sample t test	• H_0: $\mu = \mu_0$ (a constant) • t = $\frac{\bar{x} - \mu_0}{s/\sqrt{n}}$ • Degrees of freedom = n - 1	• SRS • Normal population OR n ≥ 30 OR graph of sample data shows no strong skewness and no outliers • n ≤ 1/10 N
	Matched pairs	Significance test	Matched pairs t test	• Create one list of differences from two matched lists • H_0: $\mu_{DIFF} = \mu_0$ (a constant) • t = $\frac{\bar{x}_{DIFF} - \mu_0}{s_{DIFF}/\sqrt{n}}$ • Degrees of freedom = n - 1 (n is the # of pairs)	• SRS or randomization of treatments • Samples are matched • Population of differences is normal OR number of differences is ≥ 30
	Two sample	Confidence interval	Two-sample t interval	• $(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$ • Degrees of freedom = n - 1 (smaller of the two) OR use calculator	• SRS from each population • Samples are independent • Normal population OR n ≥ 30 OR graph of sample data shows no strong skewness and no outliers for each sample • n ≤ 1/10 N for each sample
		Significance test	Two-sample t test	• H_0: $\mu_1 = \mu_2$ • t = $\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$ • Degrees of freedom = n - 1 (smaller of the two) OR use calculator	• SRS from each population • Samples are independent • Normal population OR n ≥ 30 OR graph of sample data shows no strong skewness and no outliers for each sample • n ≤ 1/10 N for each sample

Proportion	One sample	Confidence interval	One-proportion z interval	• $\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	• SRS • $n\hat{p}$ and $n(1-\hat{p})$ (observed number of successes and failures) are 10 or more • $n \leq 1/10\ N$
		Significance test	One-proportion z test	• H_0: $p = p_0$ (a constant) • $z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$	• SRS • np_0 and $n(1-p_0)$ (expected number of successes and failures according to H_0) are 10 or more • $n \leq 1/10\ N$
	Two sample	Confidence interval	Two-proportion z interval	• $(\hat{p}_1 - \hat{p}_2) \pm z^* \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$	• Independent SRSs from each population • $n_1\hat{p}_1$, $n_1(1-\hat{p}_1)$, $n_2\hat{p}_2$, and $n_2(1-\hat{p}_2)$ (observed number of successes and failures) are 10 or more for each sample • $n \leq 1/10\ N$ for each sample
		Significance test	Two-proportion z test	• H_0: $p_1 = p_2$ • $z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\hat{p}_C(1-\hat{p}_C)}{n_1} + \frac{\hat{p}_C(1-\hat{p}_C)}{n_2}}}$ where $\hat{p}_C = \frac{\text{successes in both samples combined}}{\text{observations in both samples combined}}$ $= \frac{x_1 + x_2}{n_1 + n_2}$	• Independent SRSs from each population • $n_1\hat{p}_1$, $n_1(1-\hat{p}_1)$, $n_2\hat{p}_2$, and $n_2(1-\hat{p}_2)$ (observed number of successes and failures) are 10 or more for each sample • $n \leq 1/10\ N$ for each sample

Distributions of Proportions	1 population, 1 variable	Significance test	Chi-square test for goodness of fit	• H_0: proportions are equal to those hypothesized in the problem • $X^2 = \Sigma \frac{(\text{obs - exp})^2}{\text{exp}}$ • Find expected counts from proportions in H_0 • Degrees of freedom = # of categories – 1	• SRS • $n \leq 1/10$ N • All expected counts are at least 5
	2 or more populations, 1 variable	Significance test	Chi-square test for homogeneity of populations	• H_0: All the populations are the same with respect to the variable of interest • $X^2 = \Sigma \frac{(\text{obs - exp})^2}{\text{exp}}$ • Expected counts = $\frac{\text{row total x column total}}{\text{table total}}$ • Degrees of freedom = (rows – 1)(columns –1)	• Independent SRSs from each population • $n \leq 1/10$ N for each sample • All expected counts are at least 5
	1 population, 2 variables	Significance test	Chi-square test for independence /association	• H_0: There is no association between the two variables of interest • $X^2 = \Sigma \frac{(\text{obs - exp})^2}{\text{exp}}$ • Expected counts = $\frac{\text{row total x column total}}{\text{table total}}$ • Degrees of freedom = (rows – 1)(columns –1)	• SRS • $n \leq 1/10$ N • All expected counts are at least 5
Slope	Linear Regression Slope	Confidence interval	Linear regression slope t interval	• $b \pm t^*SE_b$ • Degrees of freedom = n – 2 (n is the # of ordered pairs)	• Linear • Independent • Normal • Equal SD • Random
		Significance test	Linear regression slope t test	• H_0: $\beta = 0$ (There is no true linear relationship between x and y.) • $t = \frac{b - 0}{SE_b}$ • Degrees of freedom = n – 2 (n is the # of ordered pairs)	