Chapter 9 (Hypothesis testing – two populations)

"test the claim that…."

	PARAMETER BEING TESTED	TEST STATISTIC USED	TI-84 select STAT, TESTS
Two Proportions	P_1 , P_2	$z = \dfrac{(\hat{p}_1 - \hat{p}_2) - (p_1 - p_2)}{\sqrt{\dfrac{\overline{p}\overline{q}}{n_1} + \dfrac{\overline{p}\overline{q}}{n_2}}}$	2-propZtest
Two Means – independent (two different groups)	μ_1 , μ_2	$t = \dfrac{(\overline{x}_1 - \overline{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\dfrac{s_1^{\ 2}}{n_1} + \dfrac{s_2^{\ 2}}{n_2}}}$ where df = smaller of n_1-1 or n_2-1 σ_1 and σ_2 unknown and not assumed equal	2-sampTtest
Two Means – matched pairs (same group **before** and **after**)	μ_d where d = x-y X = before Y = after	$t = \dfrac{\overline{d} - \mu_d}{s_d / \sqrt{n}}$ where df = $n - 1$	T-test (on the differences "d")

Chapter 9 (Confidence Intervals – two populations)

"Construct a ___% confidence interval for the…"

	Confidence interval for	Formula USED	TI-84 select STAT, TESTS
Two Proportions	$P_1 - P_2$	$(\hat{p}_1 - \hat{p}_2) - E < p_1 - p_2 < (\hat{p}_1 - \hat{p}_2) + E$ where $E = z_{\alpha/2} \sqrt{\dfrac{\hat{p}_1\hat{q}_1}{n_1} + \dfrac{\hat{p}_2\hat{q}_2}{n_2}}$	2-propZint
Two Means – independent (two different groups)	$\mu_1 - \mu_2$	$(\overline{x}_1 - \overline{x}_2) - E < (\mu_1 - \mu_2) < (\overline{x}_1 - \overline{x}_2) + E$ where $\text{E} = t_{\alpha/2} \sqrt{\dfrac{s_1^{\ 2}}{n_1} + \dfrac{s_2^{\ 2}}{n_2}}$ df = smaller of n_1-1 or n_2-1 σ_1 and σ_2 unknown and not assumed equal	2-sampTint
Two Means – matched pairs (same group **before** and **after**)	μ_d where d = x-y X = before Y = after	$\overline{d} - E < \mu_d < \overline{d} + E$ where $E = t_{\alpha/2} \cdot \left(s_d / \sqrt{n} \right)$ df = $n - 1$	T-interval (on the differences "d")

If zero is included in your confidence interval then this indicates that there is no difference between the two groups. For Example: -0.25 < $\mu_1 - \mu_2$ < 0.54 You can see that zero is included in the interval this means that $\mu_1 - \mu_2$ = 0 which indicates that $\mu_1 = \mu_2$

Chapter 10 (linear regression)

Find the linear correlation coefficient (r)
Determine if a significant linear correlation exists
Find the best predicted $\hat{y}$ when x is given

- If there is a significant linear correlation then use the regression equation to make predictions.
- If there is NO significant linear correlation then use $\bar{y}$ to make predictions

TI83/84 Instructions:

1. Hit **Stat, Edit.**
2. Enter your data into any two lists, preferably L1 and L2 since they are the default.
3. To create a scatter plot, we need to get into **Stat-Plot**, which is above the **Y=** key, the upper left hand button.
4. Once in **Stat-Plot**, we select the first plot, highlight **On** and hit enter if it is not already turned on, select the first type of plot from the six available, make sure L1 and L2 are the x and y lists unless your data is in another set of lists, and then select the mark we want used.
5. Now, we hit **Zoom**, which is in the middle of the top buttons, and select the **9th option-Zoom Stat**. This will bring up our scatter plot, it **ZOOM**s in on the **STAT**istical data.
6. If it says **Dim Mismatch** or some such error, look at your lists, there may be one more entry in one list than the other, so the **DIM**ensions aren't the same. Or, look in the **Y=** area. If there are any equations in any of the "y=" spots, delete them.
7. Now, to find the line of best fit and correlation coefficient information, we hit **Stat, Calc, 8:LinReg (a+bx).** This will bring up what a=, b=, r squared, and r. (*If r doesn't show up, then hit **2nd, Catalog (above 0), D, DiagnosticsOn, enter, enter.***)
8. Once you have the line of best fit, you can enter it into **Y=** and hit graph to see it fitted onto your data. If it doesn't seem to fit the data, a mistake has occurred somewhere, go find it.

Chapter 11 (Multinomial and Contingency Tables)

Testing for independence…

H_0 - one variable INDEPENDENT of second variable
H_1 - one variable DEPENDENT of second variable

Test Statistic: $\chi^2 = \sum \dfrac{(O-E)^2}{E}$ or use TI 83/84

TI 83/84 instructions:

1) 2nd , x^{-1} (on some calculators press MATRIX)
2) Right arrow to EDIT press enter
3) Enter your observed values in matrix and press 2nd QUIT when done
4) Press STAT and right arrow to TEST
5) Select χ^2 - Test then press enter
6) You will see that your expected values are stored in matrix B and your observed values are stored in matrix A. Select calculate at the bottom of your screen and press enter.
7) You should now see your **tests statistic and p-value**.
8) If you want to see your expected value, go to matrix B. 2nd , x^{-1} (on some calculators press MATRIX) select B and press enter twice.

Critical Value: Always right tail. Obtain from table A-4

Goodness-of-Fit Tests….. (with one row of data)

H_0 - all probabilities equal
H_1 - at least on of the probabilities is different from others

Test Statistic: $\chi^2 = \sum \dfrac{(O-E)^2}{E}$

If you wish to use your TI83/84:

1) Enter the observed values (O) into L1
2) Calculate E by taking the sum of L1 and dividing it by the number of categories and storing that into E.
3) Example: If the number of categories is 7 this is what you would see: $sum(L_1)/7 \rightarrow E$
    i. select 2nd, STAT, right arrow to MATH, scroll down to see sum
    ii. select STO to get →
    iii. select ALPHA , SIN to get E

4) Now enter $sum((L_1 - E)^2 / E)$ and press enter to get the test statistic.

Critical Value: Always right tail. Obtain from table A-4