TI and Casio Calculator Directions from Advanced High School Statistics

First Edition

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TI-83/84: Entering data

The first step in summarizing data or making a graph is to enter the data set into a list. Use STAT, Edit.

1. Press STAT.
2. Choose 1:Edit.
3. Enter data into L1 or another list.

TI-84: Calculating Summary Statistics

Use the STAT, CALC, 1-Var Stats command to find summary statistics such as mean, standard deviation, and quartiles.

1. Enter the data as described previously.
2. Press STAT.
3. Right arrow to CALC.
4. Choose 1:1-Var Stats.
5. Enter L1 (i.e. 2ND 1) for List. If the data is in a list other than L1, type the name of that list.
6. Leave FreqList blank.
7. Choose Calculate and hit ENTER.

TI-83: Do steps 1-4, then type L1 (i.e. 2nd 1) or the list's name and hit ENTER.

TI-83/84: Drawing a box plot

1. Enter the data to be graphed as described previously.
2. Hit 2ND Y= (i.e. STAT PLOT).
3. Hit ENTER (to choose the first plot).
4. Hit ENTER to choose ON.
5. Down arrow and then right arrow three times to select box plot with outliers.
6. Down arrow again and make Xlist: L1 and Freq: 1.
7. Choose ZOOM and then 9:ZoomStat to get a good viewing window.

TI-83/84: What to do if you cannot find L1 or another list

Restore lists L1-L6 using the following steps:

1. Press STAT.
2. Choose 5:SetUpEditor.
3. Hit ENTER.

TI-84: Computing the binomial formula, $P(X = k) = \binom{n}{k} p^k (1-p)^{n-k}$

Use 2ND VARS, binompdf to evaluate the probability of *exactly* k occurrences out of n independent trials of an event with probability p.

1. Select 2ND VARS (i.e. DISTR)
2. Choose A:binompdf (use the down arrow).
3. Let trials be n.
4. Let p be p
5. Let x value be k.
6. Select Paste and hit ENTER.

TI-83: Do steps 1-2, then enter n, p, and k separated by commas:
binompdf(n, p, k). Then hit ENTER.

TI-84: Computing $P(X \leq k) = \binom{n}{0} p^0 (1-p)^{n-0} + ... + \binom{n}{k} p^k (1-p)^{n-k}$

Use 2ND VARS, binomcdf to evaluate the cumulative probability of *at most* k occurrences out of n independent trials of an event with probability p.

1. Select 2ND VARS (i.e. DISTR)
2. Choose B:binomcdf (use the down arrow).
3. Let trials be n.
4. Let p be p
5. Let x value be k.
6. Select Paste and hit ENTER.

TI-83: Do steps 1-2, then enter the values for n, p, and k separated by commas as follows:
binomcdf(n, p, k). Then hit ENTER.

TI-84: Finding area under the normal curve

Use 2ND VARS, normalcdf to find an area/proportion/probability to the left or right of a Z-score or between two Z-scores.

1. Choose 2ND VARS (i.e. DISTR).
2. Choose 2:normalcdf.
3. Enter the Z-scores that correspond to the lower (left) and upper (right) bounds.
4. Leave μ as 0 and σ as 1.
5. Down arrow, choose Paste, and hit ENTER.

TI-83: Do steps 1-2, then enter the lower bound and upper bound separated by a comma, e.g. normalcdf(2, 5), and hit ENTER.

TI-84: Find a Z-score that corresponds to a percentile

Use 2ND VARS, invNorm to find the Z-score that corresponds to a given percentile.

1. Choose 2ND VARS (i.e. DISTR).
2. Choose 3:invNorm.
3. Let Area be the percentile as a decimal (the area to the left of desired Z-score).
4. Leave μ as 0 and σ as 1.
5. Down arrow, choose Paste, and hit ENTER.

TI-83: Do steps 1-2, then enter the percentile as a decimal, e.g. invNorm(.40), then hit ENTER.

TI-83/84: 1-proportion z-interval

Use STAT, TESTS, 1-PropZInt.

1. Choose STAT.
2. Right arrow to TESTS.
3. Down arrow and choose A:1-PropZInt.
4. Let x be the *number* of yes's (must be an integer).
5. Let n be the sample size.
6. Let C-Level be the desired confidence level.
7. Choose Calculate and hit ENTER, which returns
   - (__,__) the confidence interval
   - $\hat{p}$ the sample proportion
   - n the sample size

TI-83/84: 1-proportion z-test

Use STAT, TESTS, 1-PropZTest.

1. Choose STAT.
2. Right arrow to TESTS.
3. Down arrow and choose 5:1-PropZTest.
4. Let p_0 be the null or hypothesized value of p.
5. Let x be the *number* of yes's (must be an integer).
6. Let n be the sample size.
7. Choose $\neq$, $<$, or $>$ to correspond to H_A.
8. Choose Calculate and hit ENTER, which returns
   - z Z-statistic
   - p p-value
   - $\hat{p}$ the sample proportion
   - n the sample size

TI-83/84: 2-proportion z-test

Use STAT, TESTS, 2-PropZTest.

1. Choose STAT.
2. Right arrow to TESTS.
3. Down arrow and choose 6:2-PropZTest.
4. Let x1 be the *number* of yes's (must be an integer) in sample 1 and let n1 be the size of sample 1.
5. Let x2 be the *number* of yes's (must be an integer) in sample 2 and let n2 be the size of sample 2.
6. Choose $\neq$, $<$, or $>$ to correspond to H_A.
7. Choose Calculate and hit ENTER, which returns:

z	Z-statistic	p	p-value
$\hat{p}_1$	sample 1 proportion	$\hat{p}$	pooled sample proportion
$\hat{p}_2$	sample 2 proportion		

TI-83/84: 1-sample t-test

Use STAT, TESTS, T-Test.

1. Choose STAT.
2. Right arrow to TESTS.
3. Down arrow and choose 2:T-Test.
4. Choose Data if you have all the data or Stats if you have the mean and standard deviation.
5. Let μ_0 be the null or hypothesized value of μ.
   - If you choose Data, let List be L1 or the list in which you entered your data (don't forget to enter the data!) and let Freq be 1.
   - If you choose Stats, enter the mean, SD, and sample size.
6. Choose $\neq$, $<$, or $>$ to correspond to H_A.
7. Choose Calculate and hit ENTER, which returns:

t	t statistic	Sx	the sample standard deviation
p	p-value	n	the sample size
$\bar{x}$	the sample mean		

TI-83/84: 1-sample t-interval

Use STAT, TESTS, TInterval.

1. Choose STAT.
2. Right arrow to TESTS.
3. Down arrow and choose 8:TInterval.
4. Choose Data if you have all the data or Stats if you have the mean and standard deviation.
   - If you choose Data, let List be L1 or the list in which you entered your data (don't forget to enter the data!) and let Freq be 1.
   - If you choose Stats, enter the mean, SD, and sample size.
5. Let C-Level be the desired confidence level.
6. Choose Calculate and hit ENTER, which returns:

(__,__)	the confidence interval
x̄	the sample mean
Sx	the sample SD
n	the sample size

TI-83/84: matched pairs t-test

Use STAT, TESTS, T-Test.

1. Choose STAT.
2. Right arrow to TESTS.
3. Down arrow and choose 2:T-Test.
4. Choose Data if you have all the data or Stats if you have the mean and standard deviation.
5. Let μ_0 be the null or hypothesized value of μ_{diff}.
   - If you choose Data, let List be L3 or the list in which you entered the differences (don't forget to enter the differences!) and let Freq be 1.
   - If you choose Stats, enter the mean, SD, and sample size of the differences.
6. Choose $\neq$, <, or > to correspond to H_A.
7. Choose Calculate and hit ENTER, which returns:

t	t statistic
p	p-value
x̄	the sample mean of the differences
Sx	the sample SD of the differences
n	the sample size of the differences

TI-83/84: 2-sample t-test

Use STAT, TESTS, 2-SampTTest.

1. Choose STAT.
2. Right arrow to TESTS.
3. Choose 4:2-SampTTest.
4. Choose Data if you have all the data or Stats if you have the means and standard deviations.
   - If you choose Data, let List1 be L1 or the list that contains sample 1 and let List2 be L2 or the list that contains sample 2 (don't forget to enter the data!). Let Freq1 and Freq2 be 1.
   - If you choose Stats, enter the mean, SD, and sample size for sample 1 and for sample 2
5. Choose $\neq$, $<$, or $>$ to correspond to H_A.
6. Let Pooled be NO.
7. Choose Calculate and hit ENTER, which returns:

t	t statistic	Sx1	SD of sample 1
p	p-value	Sx2	SD of sample 2
df	degrees of freedom	n1	size of sample 1
$\bar{x}_1$	mean of sample 1	n2	size of sample 2
$\bar{x}_2$	mean of sample 2		

TI-84: Chi-square goodness of fit test

Use STAT, TESTS, X^2GOF-Test.

1. Enter the observed counts into list L1 and the expected counts into list L2.
2. Choose STAT.
3. Right arrow to TESTS.
4. Down arrow and choose D:X^2GOF-Test.
5. Leave Observed: L1 and Expected: L2.
6. Enter the degrees of freedom after df:
7. Choose Calculate and hit ENTER, which returns:

X^2	chi-square test statistic
p	p-value
df	degrees of freedom

TI-83: Unfortunately the TI-83 does not have this test built in. To carry out the test manually, make list L3 = (L1 - L2)^2 / L2 and do 1-Var-Stats on L3. The sum of L3 will correspond to the value of X^2 for this test.

TI-83/84: Entering data into a two-way table

1. Hit 2ND x^{-1} (i.e. MATRIX).
2. Right arrow to EDIT.
3. Hit 1 or ENTER to select matrix A.
4. Enter the dimensions by typing #rows, ENTER, #columns, ENTER.
5. Enter the data from the two-way table.

TI-83/84: Chi-square test of homogeneity and independence

Use STAT, TESTS, X^2-Test.

1. First enter two-way table data as described in the previous box.
2. Choose STAT.
3. Right arrow to TESTS.
4. Down arrow and choose C:X^2-Test.
5. Down arrow, choose Calculate, and hit ENTER, which returns
   - X^2 chi-square test statistic
   - p p-value
   - df degrees of freedom

TI-83/84: Finding the expected counts

1. First enter two-way table data as described previously.
2. Carry out the chi-square test of homogeneity or independence as described in previous box.
3. Hit 2ND x^{-1} (i.e. MATRIX).
4. Right arrow to EDIT.
5. Hit 2 to see matrix B.

   This matrix contains the expected counts.

TI-84: finding b_0, b_1, R^2, and r for a linear model

Use STAT, CALC, LinReg(a + bx).

1. Choose STAT.
2. Right arrow to CALC.
3. Down arrow and choose 8:LinReg(a+bx).
   - Caution: choosing 4:LinReg(ax+b) will reverse a and b.
4. Let Xlist be L1 and Ylist be L2 (don't forget to enter the x and y values in L1 and L2 before doing this calculation).
5. Leave FreqList blank.
6. Leave Store RegEQ blank.
7. Choose Calculate and hit ENTER, which returns:

a	b_0, the y-intercept of the best fit line
b	b_1, the slope of the best fit line
r^2	R^2, the explained variance
r	r, the correlation coefficient

TI-83: Do steps 1-3, then enter the x list and y list separated by a comma, e.g. LinReg(a+bx) L1, L2, then hit ENTER.

TIP: What to do if r^2 and r do not show up on a TI-83/84

If r^2 and r do now show up when doing STAT, CALC, LinReg, the *diagnostics* must be turned on. This only needs to be once and the diagnostics will remain on.

1. Hit 2ND 0 (i.e. CATALOG).
2. Scroll down until the arrow points at DiagnosticOn.
3. Hit ENTER and ENTER again. The screen should now say:

```
DiagnosticOn
               Done
```

TIP: What to do if a TI-83/84 returns: ERR: DIM MISMATCH

This error means that the lists, generally L1 and L2, do not have the same length.

1. Choose 1:Quit.
2. Choose STAT, Edit and make sure that the lists have the same number of entries.

TI-83/84: Linear regression t-test on β_1

Use STAT, TESTS, LinRegTTest.

1. Choose STAT.
2. Right arrow to TESTS.
3. Down arrow and choose F:LinRegTest. (On TI-83 it is E:LinRegTTest).
4. Let Xlist be L1 and Ylist be L2. (Don't forget to enter the x and y values in L1 and L2 before doing this test.)
5. Let Freq be 1.
6. Choose $\neq$, $<$, or $>$ to correspond to H_A.
7. Leave RegEQ blank.
8. Choose Calculate and hit ENTER, which returns:

t	t statistic	b	b_1, slope of the line
p	p-value	s	st. dev. of the residuals
df	degrees of freedom for the test	r^2	R^2, explained variance
a	b_0, y-intercept of the line	r	r, correlation coefficient