

Calculator Instructions

This is a “little” cheatsheet for you to use to review how to do certain critical operations on the calculator. The instructions are for a TI-83, because to my knowledge that is what almost everyone is using. If you would like one for the TI-89, let me know. I’m not very good with it, though. Operations underlined are the actual keys. Operations in *italics* are NOT critical but might be useful. They probably aren’t worth learning if you have yet to do so. NEVER EVER WRITE CALCULATOR DIRECTIONS AS PART OF AN ANSWER.

Overview

Entering data

STAT. EDIT.

Calculating information about a set of data

STAT. CALC

Calculating probabilities

2nd. DISTR.

Plotting data

2nd. STATPLOT.

Generating data according to a probability

MATH. PRB.

Inference (tests/confidence intervals)

STAT. TESTS.

Summarizing Data

Summary statistics of a set of data

STAT. CALC. 1-VAR STATS. List #

-gives 5 # summary, mean, standard deviation (remember to read *s* if the data is a sample (99% of the time), σ only when it’s a population)

Histograms, boxplots

STATPLOT

- remember to set the window, or you can use ZOOM. ZOOMSTAT. to focus the window.
- for histograms, use Xscl under WINDOW to set the width of each bar
- use trace to identify values quickly
- use the box plot with dots (on the left) for a modified plot (usually what will be used)
- *if you’re given values and counts (e.g., there were 10 people with 5’s, 8 people with 4’s, 9 people with 3’s, and 3 people with 2’s), rather than raw data, you can enter each value (5,4,3,2) into L1, and you can enter the counts in L2 (10,8,9,3), and then set Freq to equal L2*

Normal Distribution

Area under a normal curve

DISTR. Normalcdf.

- enter normalcdf (lower value, upper value, mean, s.d.)
- enter normalcdf (s.d.s to the left, s.d.s to the right) if your values are normalized (z-scores), i.e., mean = 0 and s.d. = 1
- if you only want the area to the right of a certain value, enter a BIG number for the max value). Vice-versa for area to the left of a certain value and min.

To find out the value and/or number of standard deviations that capture a certain percentage of the density curve

- use DISTR. DRAW. Shade in order to see the normal curves (t curve and chi-square as well)

DISTR. invNorm

- enter invNorm (area under curve to the left-as a decimal, mean, s.d.)
- for # of s.d.s, enter invNorm (area), and you will get how many s.d.s to the right and left

Normal probability plot

STATPLOT.

-then enter the straight line on the lower right option. If the line's linear, the data is normal. If it's curved or shaped otherwise, it's not normal. If a point is way off of the line, it's an outlier.
- the data does NOT need to be sorted ahead of time.

Linear Regression
Scatterplot

- enter x-values and y-values in separate lists (use L1 and L2, respectively, to keep it simple)

STATPLOT

-use scatterplot box, and use ZOOMSTAT to focus on the data
-ALWAYS ALWAYS ALWAYS look at this before doing any regression calculations

Linear Regression

STAT. CALC. LinReg(a+bx) (L1,L2)

-output should include intercept, slope, r^2 , and r.
-if you don't see r^2 and r, then go to CATALOG, and scroll down to DIAGNOSTIC ON, and hit enter.

Residuals

-after calculating a regression, you can view residual values by going to LIST and scrolling down to RESID
-you can do a residual plot by doing a scatterplot with your original x-value as x, and RESID as y
-you can view statistics on the residuals by entering 1 var stats. RESID.

Non-linear relationships
(exponential, power)

-do these when the scatterplot appears curved
-take log of L1 (x) first, and then do a regression of log x on y to test for an exponential relationship
-take log of L2 (y) as well and regress log x on log y to test for a power relationship

Random Variables

To generate random integers (useful for when you have to do a simulation on a free response question)

MATH.PRB.RANDINT (min#,max#, # of #s you want)

To generate a random # between 0 and 1

MATH.PRB.RAND

To generate random numbers from a normal distribution

MATH.PRB.RANDNORM (mean, s.d., # of #s to generate)

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To generate a random binomial number MATH.RANDBIN. (enter 1 for success/2 for failure, probability of success, # of #s to generate)

Binomial Distribution

Probability of a count (e.g., if I roll a die 10 times, what are the odds I get a 6 exactly 3 times?) DISTR.BINOMPDF. (# of trials, probability of success, # of successes)
-binompdf (10, 0.166667, 3)

Probability of a count or less (e.g., if I flip a coin 12 times, what are the odds I get heads 4 or fewer times?) DISTR.BINOMCDF. (# of trials, probability of success, max # of successes)
-binomcdf (12, 0.5, 4)
-from the previous example, if you want to know “what are the odds I get heads 5 or more times,” the easiest way is to calculate $1 - \text{binomcdf}(12, 0.5, 4)$

Inference

NOTE: I'm lazy, and I still prefer to do these by hand unless they're very time consuming, e.g., chi-squared, because it's the only way I can be confident of my answer. If you have time, you should do both!!!

Confidence interval for known s.d. STAT.TESTS.Z-INTERVAL.
-you can enter the raw data in the list, or simply enter the key statistics (mean, s.d., n, conf. level)
-be sure you get whether it's a 1 or 2 way test
-always write out the formulas on your answer

Hypothesis test for known s.d. STAT.TESTS.Z-TEST.
-very similar to above, but you need H_0 here

2 Sample C.I./Hypothesis test for known s.d. (very rare!) STAT.TESTS.2-SAMP Z-INTERVAL/TEST

C.I./Hypothesis test for unknown s.d. STAT.TESTS.T-INTERVAL/T-TEST

2 Sample C.I./Hypothesis test for unknown s.d.s STAT.TESTS.2-SAMP T-INTERVAL/TEST

Confidence interval/hypothesis test for proportions STAT.TESTS.1 PROP Z-INTERVAL/TEST

Confidence interval/hypothesis test for 2 proportions STAT.TESTS.2 PROP Z-INTERVAL/TEST

Chi Square test for goodness of fit, association, independence, etc. STAT.TESTS.X² TEST
-note: it's best to enter the data in to a matrix first. To do so hit MATRX.EDIT, and enter the amount of rows and then columns

Testing for the slope of line STAT.TESTS.LinRegTTest
-note: you need to have raw data in a list first
-be sure you know what you're checking for about the slope of the line

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To restore a deleted list (if the list is L1 through L6), just go to the position that the list should be in, hit 2nd insert and then hit 2nd and the list number on the calculator. For example, if List 5 was inadvertently deleted, highlight L6 on the calculator, press 2nd insert, and a open space will present itself, then press 2nd L5 (L5 is above number 5 on calculator) and List 5 should be restored.

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