TI 83 / TI 84 Calculator Tips for Statistics

**Descriptive Statistics**
To find the mean, standard deviation, median, Q₁ & Q₃:
first enter data into a list:
Stat – Edit – scroll up to top of list till L₁ is highlighted,
press clear, scroll down, enter data, 2nd Quit.
Then enter Stat, Calc, 1-Var Stats, 2nd, L₁ or appropriate list #.
Example: given the following data: {1, 3, 7, 9},
determine the mean, standard deviation and variance.
enter “Stat”, “Edit”, scroll to top of list, “clear”, scroll
down, enter “1”, “3”, “7”, “9” 2nd, Quit, “Stat”, “Calc”,”
“1-Var Stats”, 2nd, L₁, enter.
Answer: mean = 5, std dev = 3.651483717,
variance = 13.3333333334 (note: to get variance, square
the standard deviation)

**Counting Principles**
Combination: C(n, r) (n objects taken r at a time; order does not matter.)
enter “n”, Math, PRB, “C”, “r”, “enter”.
Permutation: P(n, r) (n objects taken r at a time; order does matter.)
enter “n”, Math, PRB, “P”, “r”, “enter”.
Factorial: ! (n objects arranged in order)
enter Math, PRB, “!”, “enter”.
Examples: How many ways can 7 books be arranged on
a bookshelf?
enter “7”, Math, PRB, “!”, “enter”.
Answer: 5040
A horse race has 12 entries. Assuming that there are not
ties, in how many ways can these horses finish first,
second, and third?
enter “12”, Math, PRB, “3”, “enter”.
Answer: 1320

**Binomial Probability**
Binomial Rules:
1. 2 outcomes
2. Fixed # of trials
3. Probabilities are constant
4. Events are independent
p = probability of success
q = probability of failure
n = number of trials
To find P(x = #):
2nd Vars – “binompdf” enter (n, p, x)
To find P(x < #):
2nd Vars – “binomcdf” enter (n, p, x)
Examples: Find the probability of getting 7 heads in 10
flips of a coin.
2nd Vars – “binompdf” (10, 0.5, 7)
Answer: 0.1171875
Find the probability of getting at least 7 heads in 10 flips
of a coin. P(x ≥ 7) = 1 – P(x ≤ 6)
1 – 2nd Vars – “binomcdf” (10, 0.5, 6)
Answer: 0.171875

**Normal Probability**
To find a probability if a Z-score is known:
2nd Vars – “normalcdf” – enter “lower limit, upper limit”
Example: P(-0.9 < Z < 1.5)
Enter 2nd Vars – “normalcdf”, (-0.9,1.5), enter.
Answer: 0.7491326798
If given x-scores, mean & std. dev:
2nd Vars – “normalcdf” – “lower limit, upper limit,
mean, std. dev.” If x > #, use 999999 as upper limit. If X
< #, use -999999 as lower limit.
Example: P(40 < x < 71), mean = 60, std dev = 18
2nd Vars – “normalcdf” (40, 71, 60, 18) enter
Answer: 0.5961767383
To find z-scores when given cumulative probabilities:
2nd Vars – “invnorm” – (enter probability as decimal)
Example: Find z-score for Pₜₐₜₜ₋ₜ = 0.80 enter
2nd Vars – “invnorm” (0.80) enter
Answer: 0.8416212335
To find an x-value given percent wanted, mean, std dev:
2nd Vars – “invnorm” (% wanted, mean, std dev)
Example: Given mean = 500, std dev = 120, find Q₁.
2nd Vars – “invnorm” (.25, 500, 120)
Answer: 419

**Confidence Intervals (1 – Sample)**
If you have raw data, first enter data into a list:
Stat – Edit – scroll up to top of list till L₁ is highlighted,
press clear, scroll down, enter data, 2nd Quit.
z-interval: Stat – Tests – “z-interval” – choose Data if you have
raw data or Stat of you have statistical data,
press enter, enter rest of info requested, press calculate.
T-interval: Stat – Tests – “t-interval” – choose Data if you have
raw data or Stat of you have statistical data,
press enter, enter rest of info requested, press calculate.
1-PropZint: Stat – Tests – “1-PropZint” Enter
information requested, press “calculate”.
Example: Given n = 20, mean = 22.9, std dev = 1.5, find the
90% CI.
Stats – Tests – “Z-interval” – “Stats”, enter statistics,
press “calculate”.
Answer: (22.348, 23.452)

**Hypothesis Testing (1-Sample)**
If you have raw data, first enter data into a list:
Stat – Edit – scroll up to top of list till L₁ is highlighted,
press clear, scroll down, enter data, 2nd Quit.
Z-Test: Stat – Tests – “Z-Test” choose Data if you have
raw data or Stat of you have statistical data, press enter,
enter rest of information requested, press “calculate”.
T-Test: Stat – Tests – “T-Test” choose Data if you have
raw data or Stat of you have statistical data,
press enter, enter rest of information requested, press “calculate”.
1-PropZTest: Stat – Tests – “1-PropZTest” enter data
requested, press “calculate”.
Example: Use z-Test to test claim: µ < 5.500, α = 0.01,
X = 5.497, s = 0.011, n = 36
Answer: p = .05 > α , therefore, fail to reject H₀. There is
not enough evidence at the 1% level to support the
claim.
Hypothesis Testing 2 Samples

If you have raw data, first enter data into a list:
Stat – Edit – scroll up to top of list till L1 is highlighted, press clear, scroll down, enter data, 2nd Quit.

2 SampZTest: Stat, Tests, 2-SampZTest, select Data if you have raw data, or Stats if you have statistical data, “enter”, enter requested information, press “calculate”.

2 SampTTest: Stat, Tests, 2-SampTTest, select Data if you have raw data, or Stats if you have statistical data, “enter”, enter requested information, enter “yes” for Pooled if $\sigma_1^2 = \sigma_2^2$, otherwise enter “no”, press “calculate”.

2-PropZTest: Stat, Tests, 2-PropZTest, enter statistical data requested, press “Calculate”.

Example 1: Claim:
$\mu_1 < \mu_2, \alpha = 0.01, \bar{x}_1, s_1, n_1, \bar{x}_2 = 1195, s_2 = 105, n_2 = 105$

Decide if you should reject or fail to reject the $H_0$.

“Stat”, “Tests”, “2-SampZTest”, “Stats”, “enter”,
$\sigma_1 = 75, \sigma_2 = 105, \bar{x}_1 = 1225, n_1 = 35, \bar{x}_2 = 1195$,
$n_2 = 105, \mu_1 < \mu_2$, press “Calculate”.

Answer: $p = 0.967 > \alpha$, therefore, fail to reject $H_0$.

Example 2:
$H_0 : \mu_1 \geq \mu_2, \alpha = 0.10, \bar{x}_1 = 0.515, s_1 = 0.305, n_1 = 11,$
$\bar{x}_2 = 0.475, s_2 = 0.215, n_2 = 9$, Assume $\sigma_1^2 = \sigma_2^2$. Decide if you should reject or fail to reject the $H_0$.

“Stat”, “Tests”, “2-SampTTest”, “Stats”, “enter”,
$\bar{x}_1 = 0.515, s_1 = 0.305, n_1 = 11, \bar{x}_2 = 0.475, s_2 = 0.215$,
$n_2 = 9, \mu_1 > \mu_2$, Pooled: Yes, press “Calculate”.

Answer: $p = 0.37 > \alpha$, therefore fail to reject $H_0$.

Example 3: Claim: $p_1 \leq p_2, \alpha = 0.10$,

$x_1 = 344, n_1 = 860, x_2 = 304, n_2 = 800$. Decide if you should reject or fail to reject the $H_0$.

“Stat”, “Tests”, “2-PropZTest”,

$x_1 = 344, n_1 = 860, x_2 = 304, n_2 = 800, p_1 < p_2$, press “calculate”.

Answer: $p = 0.20 > \alpha$, therefore fail to reject the $H_0$.

Linear Regression & Correlation

Before calculating $r$, you must enter the Diagnostic On command.

2nd, 0 (catalog), “Diagnostic On”, enter, enter.

First enter raw data into a list:
Stat – Edit – scroll up to top of list till L1 is highlighted, press clear, scroll down, enter data, 2nd Quit.

“Stat”, “CALC”, “LinReg (ax + b)”, 2nd, L1 or appropriate list # for x, 2nd, L2 or appropriate list # for y, enter. Output should look something like the following:

LinReg

$y = ax + b$ where

$a = 11.8244078$ $a = \text{slope}$

$b = 35.30117105$ $b = \text{y-intercept}$

$r^2 = 0.9404868083$ $r^2 = \text{coefficient of determination}$

$r = 0.9697869912$ $r = \text{correlation coefficient}$