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.
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.
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, \texttt{binompdf} to evaluate the probability of \textit{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 \texttt{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 \( n, p, k \) separated by commas: \texttt{binompdf(n, p, k)}. Then hit ENTER.

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

Use 2ND VARS, \texttt{binomcdf} to evaluate the cumulative probability of \textit{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 \texttt{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 \( n, p, k \) separated by commas as follows: \texttt{binomcdf(n, p, k)}. Then hit ENTER.

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TI-84: Finding area under the normal curve

Use 2ND VARS, \texttt{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 \( \mu \) as 0 and \( \sigma \) 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. \texttt{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 $\mu$ as 0 and $\sigma$ 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.

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**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
   \[
   (\_, \_) \quad \text{the confidence interval}
   \]
   \[
   \hat{p} \quad \text{the sample proportion}
   \]
   \[
   n \quad \text{the sample size}
   \]

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**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
   \[
   z \quad \text{Z-statistic}
   \]
   \[
   p \quad \text{p-value}
   \]
   \[
   \hat{p} \quad \text{the sample proportion}
   \]
   \[
   n \quad \text{the sample size}
   \]
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 \( x_1 \) be the \( \text{number} \) of yes’s (must be an integer) in sample 1 and let \( n_1 \) be the size of sample 1.
5. Let \( x_2 \) be the \( \text{number} \) of yes’s (must be an integer) in sample 2 and let \( n_2 \) be the size of sample 2.
6. Choose \( \neq, <, \text{or} > \) to correspond to \( H_A \).
7. Choose Calculate and hit ENTER, which returns:
   \[
   z \quad \text{Z-statistic} \\
   \hat{p}_1 \quad \text{sample 1 proportion} \\
   \hat{p}_2 \quad \text{sample 2 proportion} \\
   \hat{p} \quad \text{pooled sample proportion}
   \]

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 \( \mu_0 \) be the null or hypothesized value of \( \mu \).
   - 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 \( \neq, <, \text{or} > \) to correspond to \( H_A \).
7. Choose Calculate and hit ENTER, which returns:
   \[
   t \quad \text{t statistic} \\
   Sx \quad \text{the sample standard deviation} \\
   p \quad \text{p-value} \\
   n \quad \text{the sample size} \\
   \bar{x} \quad \text{the sample mean}
   \]
**TI-83/84: 1-sample t-interval**

Use \textit{STAT}, \textit{TESTS}, \textit{TInterval}.

1. Choose \textit{STAT}.
2. Right arrow to \textit{TESTS}.
3. Down arrow and choose \textit{8:TInterval}.
4. Choose \textit{Data} if you have all the data or \textit{Stats} if you have the mean and standard deviation.
   - If you choose \textit{Data}, let \textit{List} be \texttt{L1} or the list in which you entered your data (don’t forget to enter the data!) and let \textit{Freq} be \texttt{1}.
   - If you choose \textit{Stats}, enter the mean, SD, and sample size.
5. Let \textit{C-Level} be the desired confidence level.
6. Choose \textit{Calculate} and hit \texttt{ENTER}, which returns:
   \begin{itemize}
   \item \texttt{(__, __)} the confidence interval
   \item \(\bar{x}\) the sample mean
   \item \(S_x\) the sample SD
   \item \(n\) the sample size
   \end{itemize}

**TI-83/84: matched pairs t-test**

Use \textit{STAT}, \textit{TESTS}, \textit{T-Test}.

1. Choose \textit{STAT}.
2. Right arrow to \textit{TESTS}.
3. Down arrow and choose \textit{2:T-Test}.
4. Choose \textit{Data} if you have all the data or \textit{Stats} if you have the mean and standard deviation.
5. Let \(\mu_0\) be the null or hypothesized value of \(\mu_{diff}\).
   - If you choose \textit{Data}, let \textit{List} be \texttt{L3} or the list in which you entered the differences (don’t forget to enter the differences!) and let \textit{Freq} be \texttt{1}.
   - If you choose \textit{Stats}, enter the mean, SD, and sample size of the differences.
6. Choose \(\neq, <, \text{or} >\) to correspond to \(H_A\).
7. Choose \textit{Calculate} and hit \texttt{ENTER}, which returns:
   \begin{itemize}
   \item \(t\) \(t\) statistic
   \item \(p\) \(p\)-value
   \item \(\bar{x}\) the sample mean of the differences
   \item \(S_x\) the sample SD of the differences
   \item \(n\) the sample size of the differences
   \end{itemize}
**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 **̸=**, **<**, or **>** to correspond to **H_A**.
6. Let **Pooled** be **NO**.
7. Choose **Calculate** and hit **ENTER**, which returns:
   - **t**: t statistic
   - **p**: p-value
   - **df**: degrees of freedom
   - **Sx1**: SD of sample 1
   - **Sx2**: SD of sample 2
   - **n1**: size of sample 1
   - **n2**: size of sample 2
   - **x̄_1**: mean of sample 1
   - **x̄_2**: mean of sample 2

**TI-84: Chi-square goodness of fit test**

Use **STAT, TESTS, X²GOF-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:X²GOF-Test**.
5. Leave **Observed**: **L1** and **Expected**: **L2**.
6. Enter the degrees of freedom after **df**.
7. Choose **Calculate** and hit **ENTER**, which returns:
   - **X²**: 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 **X²** 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, X²-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:X²-Test.
5. Down arrow, choose Calculate, and hit ENTER, which returns
   - X² 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.
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.

2. Choose STAT, Edit and make sure that the lists have the same number of entries.
TI-83/84: Linear regression $t$-test on $\beta_1$

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