TI-83/83 Plus: Hypothesis Testing for One-Sample Proportion

The following pages contain some instructions on the usage of the TI-83/83 Plus graphing calculator.
The example used below is taken out of David Moore's text titled "The Basic Practice of Statistics, 2nd Edition".

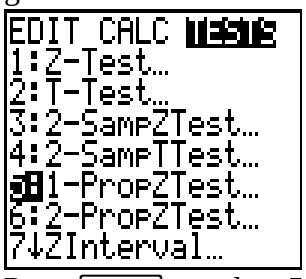
Example#8.6 Is this coin fair? (on page 438): A coin that is balanced should come up heads half the time in the long run. The population for coin tossing contains the results of tossing the coin forever. The parameter p is the probability of a head, which is the proportion of all tosses that give a head. The tosses we actually make are an SRS from this population.

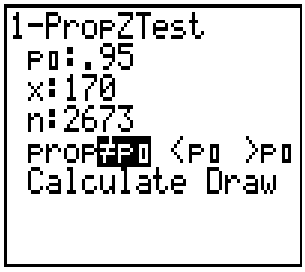
The French naturalist Count Buffon (1707-1788) tossed a coin 4040 times. He got 2048 heads. The sample proportion of heads is computed by

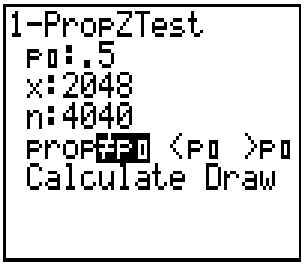
$$\hat{p} = \frac{2048}{4040} = 0.5069$$

That is slightly over one-half. Is this evidence that Buffon's coin was not balanced? This is a job for a significance test.

Press [STAT]. Press [▶] two times to scroll right to the TESTS menu option. Press [▼] four times to move the cursor down to **5:1-PropZTest**, which stands for one-sample z test for population proportion. At this point, your screen should look like the screen on the left given below.

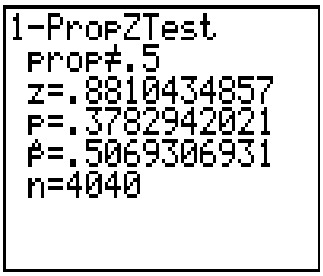


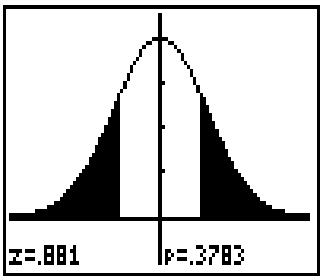




Press [ENTER] to select **5:1-PropZTest** and go into the STAT TESTS menu screen. At this point, your screen should look like the screen in the middle given above with the cursor blinking by $\mathbf{p_o}$**:** You may possibly have different numbers.
Since the null hypothesis says that the coin is balanced (p=0.5), Type in 0.5 by by $\mathbf{p_o}$**:** Press [▼] to move the cursor down to **x:** Type in 2048 for the number of the heads in the sample. Press [▼] to move the cursor down to **n:** Type in 4040 for the number of tosses, which is the sample size. Press [▼] to move the cursor down to **prop:**$\mathbf{\neq p_o}$ $\mathbf{< p_o}$ $\mathbf{> p_o}$ Since the alternative hypothesis for this example is a two-sided alternative hypothesis, scroll over to the $\mathbf{\neq p_o}$ option and press [ENTER] to select that option. Press [▼] to move the cursor down to **Calculate** option. At this point, your screen should look like the screen on the right given above with the cursor blinking over the **Calculate** option.

Press [ENTER] to select the **Calculate** option. Your calculated result screen should look like the screen on the left given below.





The above computed P-value suggests that we failed to find good evidence against the null hypothesis H_o: p=0.5. Therefore we cannot conclude that the coin is unbalanced.

Because the alternative hypothesis is two-sided, the P-value is the area under the standard normal curve more than 0.88 away from 0 in either direction. We could also draw the standard normal distribution curve with the observed value of z=0.881 and the computed P-value of P=0.3783 indicated by the shaded regions of the curve.

Press [STAT]. Press [▶] two times to scroll right to the TESTS menu option. Press [▼] four times to move the cursor down to **5:1-PropZTest** Press [ENTER] to select **5:1-PropZTest** and go into the STAT TESTS menu screen. Scroll all the way down to the **Calculate Draw** option. Press [▶] to move the cursor over the **Draw** option. Press [ENTER] to select this option. Your screen should look like the screen on the right given above.