

Technology Insights 11: Hypothesis Tests for Proportions and Means

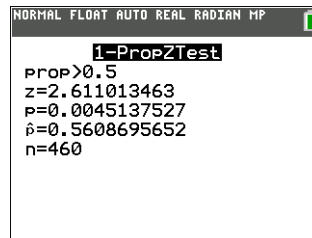
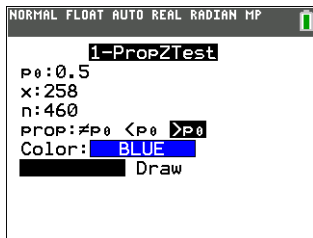
The TI-84 has several options for conducting hypotheses tests under the **stat** TESTS menu:

- 1-Sample Proportion: **1-PropZTest**
- 1-Sample Mean (σ -known) **Z-Test** (Data or statistics)
- 1-Sample Mean (σ -unknown) **T-Test** (Data or statistics)

Example 1 A survey of 460 adults asked whether they miss going to restaurants resulted in 258 saying they did miss going out to restaurants. Test the claim that more than half of adults miss going out to a restaurant using $\alpha = 0.05$.

TI-84

Answer: $n = 460; x = 258; \begin{cases} H_0: p = 0.5 \\ H_1: p > 0.5 \end{cases}$ claim; $\alpha = 0.05$; Use **1-PropZTest**.



Since $p = 0.0045$ and $p < \alpha$, we reject H_0 . There is sufficient evidence that more than 50% of all adults miss going out to a restaurant.

EasyCalc

Select **Hypothesis Test for a Single Proportion**

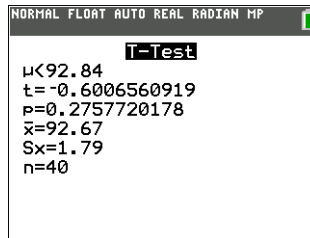
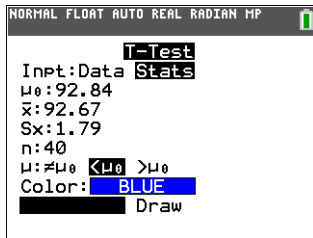
Hypothesis Test for a Single Proportion

x=	258
n=	460
Sample Proportion=	0.5609
Hypothesized Proportion: p=	0.5
Type:	Ha: p > 0.5
z-statistic=	2.6110
P-value=	0.0045

Example 2 Official MLB baseballs, when dropped 24 feet onto a concrete surface, are to bounce an average of 92.84 inches. In a test of 40 new balls, the bounce heights had a mean of 92.67 in, with a standard deviation of 1.79 in. Use a significance level of 0.01 to determine whether there is sufficient evidence to support the claim that the new balls have bounce heights with a mean less than the 92.84 inches. Does it appear that the new balls are different?

TI-84

Answer: $\mu = 92.84$; $n = 40$; $\bar{x} = 92.67$; $s = 1.79$ $\left\{ \begin{array}{l} H_0: \mu = 92.84 \\ H_1: \mu < 92.84 \end{array} \right.$ claim; $\alpha = 0.01$; Use **T-Test** (STATS)



Since $p = 0.2758$, and $p > \alpha$, we fail to reject H_0 . There is not sufficient evidence to support the claim that the mean bounce height of the new MLB baseballs is less than 92.84 inches. It appears the balls are the same.

EasyCalc

Select **Hypothesis Test for a Single Mean** (Using Statistics)

Hypothesis Test for a Mean Using Statistics

Sample mean= 92.67
 Standard Deviation= 1.79
 Sample Size= 40

Hypothesized Mean: $\mu =$ 92.84
 Type: $H_a: \mu < 92.84$

t-statistic= -0.6007

P-Value= 0.2758

Confidence Interval

Confidence Level= 0.98

91.9834 93.3566

Creating a 98% confidence interval we can see an estimate of the true mean is between 91.98 inches and 93.36 inches which includes the desired $\mu = 92.84$.