

## Hypothesis Testing by TI Graphing Calculator

### TI83 and 84:

**Note:** the calculator output once the test is completed shows the p value. It appears as a small p equal to a value. That is all we need to draw a conclusion about a particular test. If p-value is less than stated  $\alpha$  we reject the Null; otherwise we fail to reject the Null.

First, look at the outputs; then, the step-by-step procedure is shown:

Output of a 1-PropZTest:

```
1-PropZTest
PROP#.5
z=-1
P=.3173105191
P=.45
n=100
```

Output of a T-Test:

```
T-Test
μ#32
t=-1.150326657
P=.2600961241
x=31.5
Sx=2.3
n=28
```

**Procedure:** Press STAT, Choose TESTS:

```
EDIT CALC TESTS
1:Z-Test...
2:T-Test...
3:2-SampZTest...
4:2-SampTTest...
5:1-PropZTest...
6:2-PropZTest...
7:Interval...
```

For proportions: 1-PropZTest; for Two Proportions, 2-PropZTest; For means, if  $\sigma$  known, Z-Test; otherwise, T-Test. For Two samples means, 2-SampTTest or 2-SampZTest.

1-PropZTest screen:

```
1-PropZTest
P0:0
x:0
n:0
PROP#P0 <P0 >P0
Calculate Draw
```

$P_0$  is the population parameter stated in the Null Hypothesis. The values of x and n come from the sample data. Often, we are given the sample proportion  $\hat{p}$ ; in that case multiply  $\hat{p}$  times n in order to find x. Round x to a whole number. Before hitting Calculate, choose the symbol that corresponds to the Alternative Hypothesis.

Z-Test:

```
Z-Test
Inpt:Data State
μ₀:0
σ:0
x̄:0
n:0
μ: μ₀ <μ₀ >μ₀
Calculate Draw
```

$\mu_0$  is the population parameter stated in the Null Hypothesis. Enter the sample data, the known population standard deviation (that is why we use Z\_Test in this case) and choose the symbol that corresponds to the Alternative Hypothesis.

The screen for 2\_PropZTest:

```
2-PropZTest
x₁:0
n₁:0
x₂:0
n₂:0
p₁: p₁ <p₂ >p₂
Calculate Draw
```

In this case, we compare two proportions;  $x_1$  and  $n_1$  correspond to one of the samples;  $x_2$  and  $n_2$  to the other. Before hitting Calculate, choose the symbol that corresponds to the Alternative Hypothesis.

```
2-SampTTest
↑x̄₁:0
Sx₁:0
n₁:0
x̄₂:0
Sx₂:0
n₂:0
↓μ₁: μ₁ <μ₂ >μ₂
```

T-Test compare two sample means, from each sample we input the sample mean ( $\bar{x}$ ), the sample standard deviation,  $S_x$  and the sample size,  $n$ . Choose the corresponding symbol of the Alternative Hypothesis and calculate.