Statistics – TI84 Calculator

Population PROPORTION (counts of success):

CONFIDENCE INTERVALS:

Calculator function: **STAT - Tests - 1-PropZint**

Input: x: count of successes (whole number, no decimals, may be given or may need to calculate it)
n: sample size
C-level: confidence level

Output: (lower number, upper number) {this is the confidence interval}
$\hat{p}$ {the sample proportion}
n {sample size}

Interpreting the interval: "We are _____% confident the true population proportion is between # and #."

Margin of error: ME = (upper number – lower number) / 2

HYPOTHESIS TESTING

Hypotheses: Null $H_0: p = \#$
Alternative $H_A: p \neq \#$ OR $H_A: p < \#$ OR $H_A: p > \#$

Calculator function: **STAT - Tests - 1-PropZTest**

Input: p_0: # from null hypothesis
x: count of successes (sample information, whole number, no decimals)
n: sample size
prop: $\neq$ $<$ $>$ (from the alternative hypothesis)

Output: prop {alternative hypothesis}
z {test statistic – the number of std devs the sample is from the null hypothesis}
p {P-value – the probability of getting the sample IF the null hypothesis is true}
$\hat{p}$ {the sample proportion}
n {sample size}

Making a Conclusion:

- If P-value < α (the level of significance) then we "reject the null hypothesis" and accept the alternative hypothesis. "There is evidence to suggest that the alternative hypothesis is correct'"
- If P-value > α (the level of significance), then we "fail to reject the null hypothesis" but cannot conclude the null is true; there is not enough evidence to decide if null hypothesis is true or not. "There is insufficient evidence to reject the null hypothesis and accept the alternative."

Confidence Interval without using calculator function 1-Prop-Zint:
(Keep as many decimals as possible in the calcualtions. Do not round until the final calculation.)

Calculate sample proportion $\hat{p}$

Calculate standard error: $SD(\hat{p}) = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

Calculate percent outside confidence interval: $a = \frac{(100-CI\ \%)}{2}$ (convert to decimal form)

Calculate critical value: $z^* = invNorm(a, 0, 1)$

Calculate margin of error: $ME = z^* * SD(\hat{p})$

Confidence interval: $\hat{p} \pm ME$

Hypothesis Testing without using calculator function 1-Prop-Ztest:

Calculate sample proportion $\hat{p}$

Calculate standard deviation: $SD(p_0) = \sqrt{\frac{p_0(1-p_0)}{n}}$

Calculate test statistic: $z = \frac{\hat{p}-p_0}{SD(p_0)}$

Calculate P-value: $p = normalcdf(lower, upper, 0,1)$

{lower and upper depend upon the alternative hypothesis. Sketch a normal curve centered at p_0, plot the sample proportion $\hat{p}$, and determine if the alternative range is above or below. Remember for a "not equal" alternative to multiply the P-value by 2}