

AP Test Review – Confidence Intervals

I. Basics

A. A C% CI gives an interval of plausible values of the parameter.

B. Generally, a CI = point estimate \pm margin of error

a) point estimate is our unbiased statistic

b) margin of error = test statistic \cdot standard deviation (error)

i) gets smaller as C decreases and n increases

ii) only accounts for chance variation (i.e. not for bias)

C. On your formula sheet: statistic \pm (critical value) \cdot (standard deviation of statistic)

D. Interpretation: We are C% confident the interval from ____ to ____ captures the (parameter of interest in context).

E. Sample size for desired margin of error (solving for n) when estimating p: $z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \leq ME$

F. Sample size for desired margin of error (solving for n) when estimating μ : $z^* \frac{\sigma}{\sqrt{n}} \leq ME$

II. Use Inference Summary handout for all formulas, conditions, and 4 step process

Tips and Common Mistakes:

- Don't confuse confidence interval with confidence level
- Remember, inference about proportions use z critical values and inference about means use t critical values (unless we know σ)
- You should be able to compare z and t distributions
- **ALWAYS** use the 4 step process when doing a CI on the short answer section
- You can use your calculator to perform CI's, but remember to always clearly state inputs and outputs (interval, confidence level, degrees of freedom, critical value)
- Remember the format for CI's on the formula sheet use parameters, you will need to translate them to statistics when writing it on your test
- If you use calculator inputs to do a CI, go back and try plugging in the formula after all short answer problems are finished, if you have time.