

Confidence Interval

A confidence interval is a range of value that is likely to contain the parameter proportion p .

eg $0.85 < p < 0.95$ ← p is proportion (probability)
← This is a C.I..
TI-84: (0.85, 0.95)

eg $0.92 < p < 0.98$

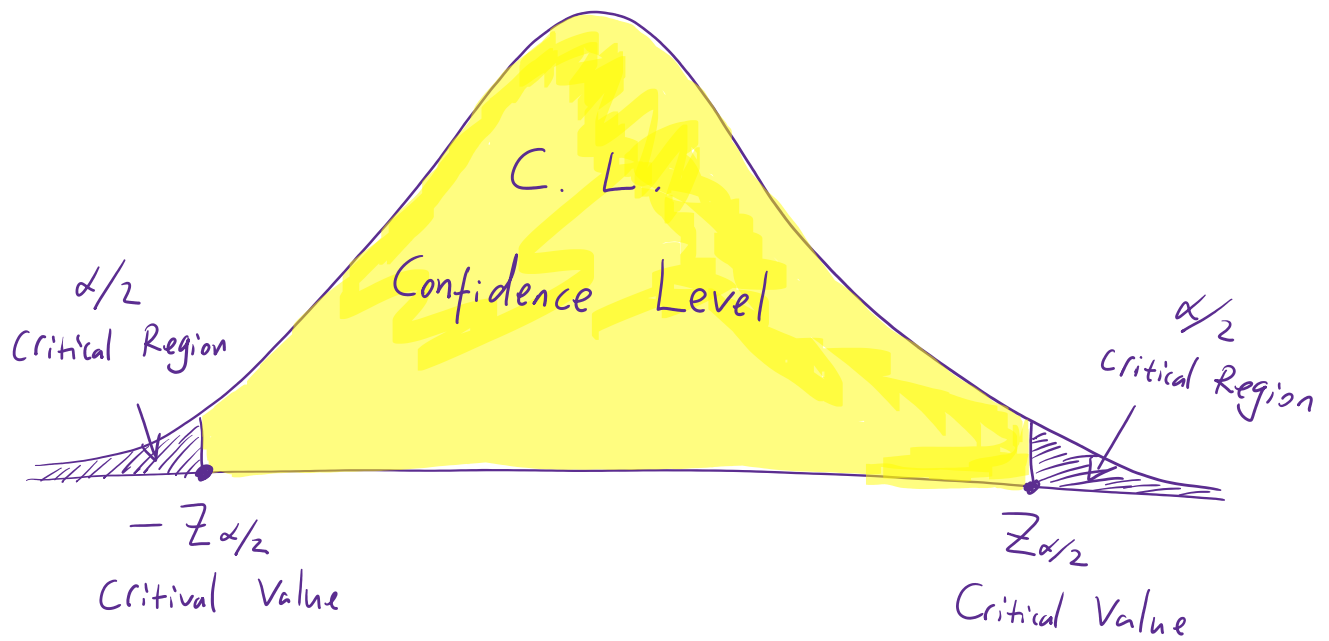
— A very good C.I. because it is narrow.

— Lowest is 92%, highest is 98%. ← for exam A^- to A^+

eg $0.62 < p < 0.95$

— This is not a good C.I. because it is wide.

— Too wide means that the confidence is "not there."



← "level of significance"

α - significant level; it is usually given. If not, then it is automatically 5%. Popular: 5%, 1%, 10%.

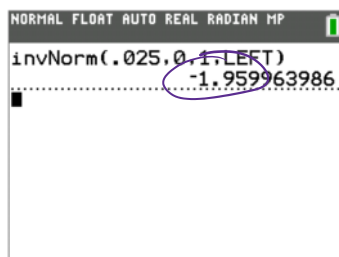
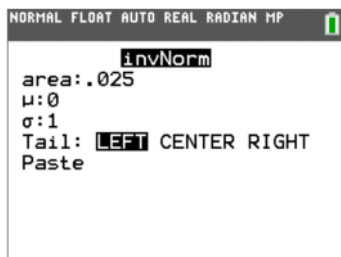
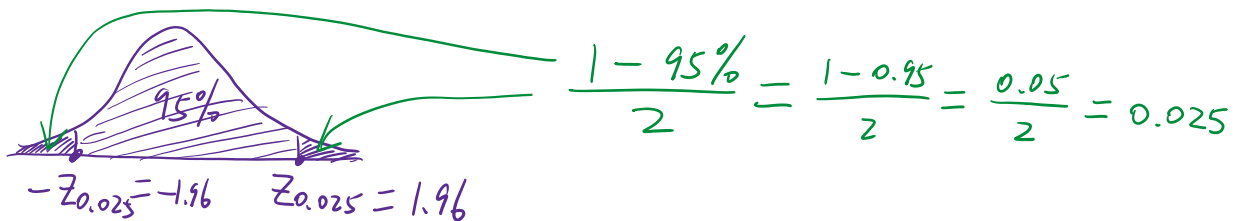
$Z_{\alpha/2} / Z_{\alpha}$ - Critical value(s). It is the cut-off Z-score for hypothesis testing. It is $Z_{\alpha/2}$, $-Z_{\alpha/2}$, Z_{α} , $-Z_{\alpha}$.

P-value - probability value. It is the area from testing.

eg Find $Z_{\alpha/2}$ for a 95% Confidence Level.

S: 95% C.I. is in the middle, and $Z_{\alpha/2}$ here $\alpha/2$ means two tails.

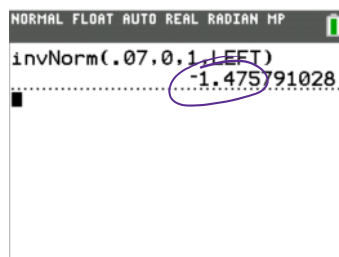
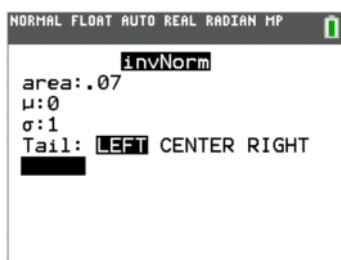
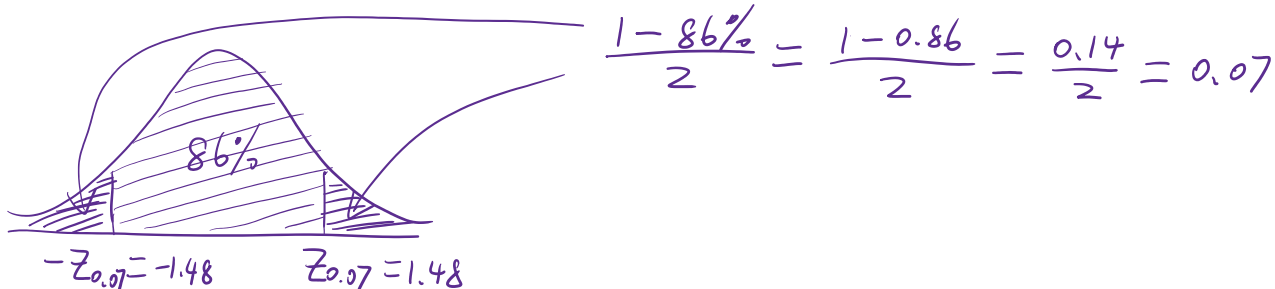
← draw the bell-curve would be helpful



$$Z_{0.025} \approx \boxed{1.96}$$

eg Find $Z_{\alpha/2}$ for a 86% Confidence Level.

S:

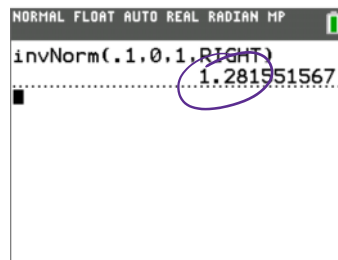
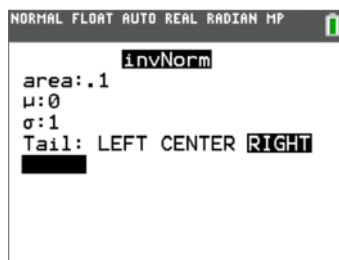
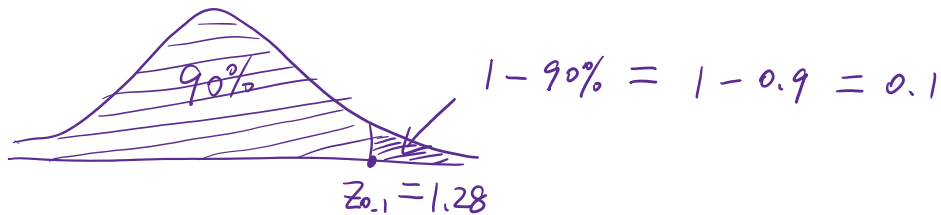


$$Z_{0.07} \approx \boxed{1.48}$$

eg Find Z_{α} for a 90% Confidence Level.

S: Z_{α} here has 1 α only, and Z_{α} is +.

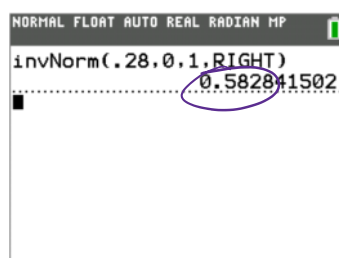
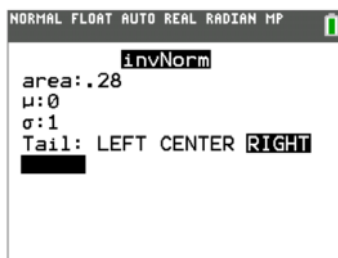
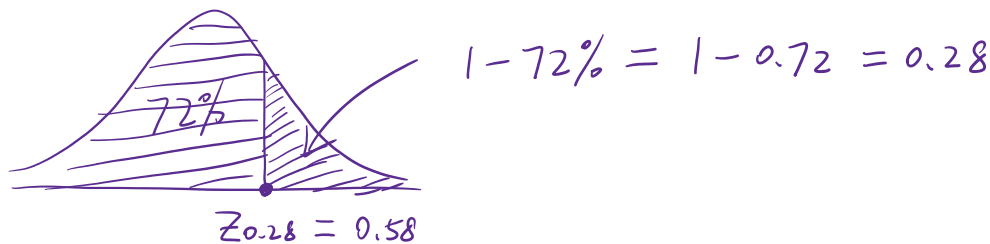
S: Z_α here has 1 α only, and Z_α is +.
It will be a right-tail bell-curve.



$$Z_{0.1} \approx \boxed{1.28}$$

eg Find Z_α for a 72% Confidence Level.

S:



$$Z_{0.28} \approx \boxed{0.58}$$