



Estimating a Population Proportion

Student Activity

Name _____

Class _____

Goal: Use \hat{p} to estimate p , where p is a population proportion and \hat{p} is a sample proportion.

$$\hat{p} = \frac{x}{n}, \text{ where } x = \text{number of successes and } n = \text{number of observations}$$

Problem 1 – Margin of Error and a Confidence Interval

A surveyor randomly selects 350 registered voters and asks if they support a proposed bill. There were 293 voters that said yes.

1. Find \hat{p} .

Margin of Error	Confidence Interval
$E = z_{\alpha/2} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$	$\hat{p} - E < p < \hat{p} + E$

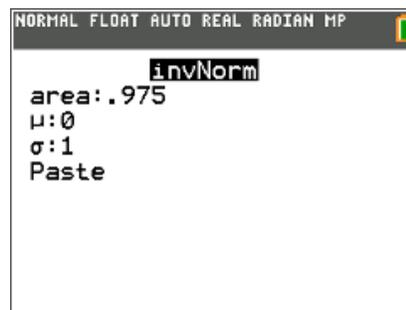
To calculate a confidence interval for the true proportion of voters who support the proposed bill, follow Steps A to D.

Step A: Find the critical value $z_{\alpha/2}$ by using the **invNorm** command in the DISTR menu (**2nd|vars**).

Step B: Use the formula to calculate the margin of error.

Step C: Calculate the confidence interval.

Step D: State your findings in complete sentences.



2. Find a 95% confidence interval. State your findings.

3. Find a 99% confidence interval. State your findings.



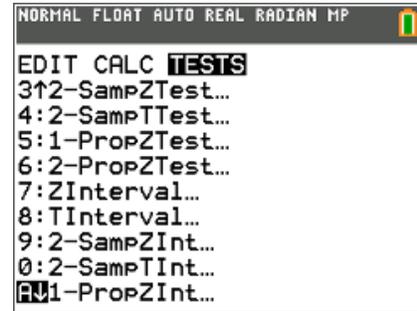
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The calculator allows this confidence interval to be found without having to first find the critical value and margin of error. Press $\boxed{\text{Stat}}$, right arrow to the **TESTS** menu and choose **1-PropZInt**. Then enter x , n , and the confidence level. Use this command to check the 95% and 99% intervals you just found. (Answers may be slightly different due to rounding.)



Problem 2 – Practice Problems

A reporter made the claim that at least 80% of teenagers in the city went to the mall at least once per week. A researcher wants to check that claim and randomly surveys 437 teenagers in the city. She finds that of the teenagers surveyed, 316 go to the mall at least once per week.

4. Find a 95% confidence interval for the true proportion of teens that go to the mall at least once per week.
5. What do you think of the reporter's claim?

A principal reported that one-third of the student body would support switching to a year-round schedule. A student checks that claim by randomly selecting and surveying 65 students. He found that 24 of those students would support switching to a year round schedule.

6. Find a 90% confidence interval for the true proportion of students who support the switch.
7. What do you think of the principal's claim?

