

A statistics professor asked her students whether or not they were registered to vote. In a sample of 50 of her students (randomly sampled from her 700 students), 30 said they were registered to vote.

- 1) (20 Points) Find a 98% confidence interval for the true proportion of the professor's students who were registered to vote. (Make sure to check any necessary conditions and to state a conclusion in the context of the problem.)
- a) What is the sample and the population in this problem.

b) What point estimate of the population proportion  $p$  does this survey give? \_\_\_\_\_

c) What is the level of confidence for this interval? \_\_\_\_\_ Find  $\alpha$  \_\_\_\_\_

d) What is the critical value use it's symbol

e) Find the margin of error?

Show formula and all values you use to find this by hand. CV: \_\_\_\_\_ E= \_\_\_\_\_

f) Find the confidence interval.

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- 2) Assuming that this class is representative of the population of all statistics students. What is the probability that the true proportion of the statistics students who were registered to vote is in your confidence interval?
- 3) According to a Gallup poll, about 73% of 18- to 29-year-olds said that they were registered to vote. Does the 73% figure from Gallup seem reasonable for the professor's students? Explain.

- 4) If the professor only knew the information from the Gallup poll and wanted to estimate the percentage of her students who were registered to vote to within  $\pm 3\%$  with 98% confidence, how many students should she sample?