

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) 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.

- 3) 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  $\pm 5\%$  with 98% confidence, how many students should she sample?