1. In 2004, ACT, Inc. reported that 71.9% (363) of 505 randomly selected college freshmen in public colleges returned to college the next year. They also found that 74.9% (853) of 1139 randomly selected college freshmen in private colleges returned to college the next year.

a. Estimate the national freshman-to-sophomore retention rate in public colleges with a 95% confidence interval.

b. Estimate the national freshman-to-sophomore retention rate in private colleges with a 95% confidence interval.

c. Choose the correct answer to the following statement: If we calculated 98% confidence intervals instead of 95% confidence intervals, the 98% confidence intervals would be
   i) narrower    ii) wider

d. If we wished to conduct our own survey of the freshman-to-sophomore retention rate \( p \) in public colleges, how many freshmen should be included in the sample if we want to estimate \( p \) to within .025 with 95% confidence? (use .72 as the preliminary estimate of \( p \)).

e. Choose the correct interpretation of the 95% confidence interval in part b:
   i) In 95% of all random samples of private colleges, the freshman-to-sophomore retention rate will be 74.9%.
   ii) In 95% of all random samples of private colleges, the freshman-to-sophomore retention rate is between 72.4% and 77.4%.
   iii) There is a 95% chance that the interval (72.4%, 77.4%) contains the true freshman-to-sophomore retention rate for private colleges.
   iv) There is a 95% chance that the true freshman-to-sophomore retention rate of private colleges is in the interval (72.4%, 77.4%)
   v) If many random samples are selected, each sample with 1139 private college freshmen, 95% of the sample freshman-to-sophomore retention rates \( \hat{p} \) will be in the interval (.724, .774).