

# PRACTICE VII

## Inference

1. In a random sample of 150 adults over the age of 45, 30 say they have played in a band at least one time in their lives.
  - (a) Construct a 99% confidence interval for the proportion of all adults over the age of 45 who have played in a band at least one time in their lives.
  - (b) Suppose that all adults over the age of 45 who have played in a band at least one time in their lives each send in a donation of \$10 to the organization Musicians without Borders, which aims to empower musicians as social activists. Assuming there are 125 000 000 adults over the age of 45 in the U.S., What is a 99% confidence interval for what these donations would total for this worthwhile charity?

2. In a random sample of 915 adults, 366 say that they believe in ghosts.
  - (a) With what margin of error can we find a 95% confidence interval for the proportion of adults who believe in ghosts?
  - (b) With what confidence can we report a margin of error of  $\pm 2$  percent in giving a confidence interval of the proportion of adults who believe in ghosts.

3. A senator's approval rating stood at 65 percent before she took a crucial vote.
  - (a) Her staff believes the rating is still around 65 percent. To confirm this, how large of a simple random sample (SRS) should the staff sample to obtain a 94% confidence interval estimate with a margin of error  $\leq 3.5\%$ .
  - (b) The senator's staff randomly samples 700 people and find 432 people approve of the senator's job performance. Is there evidence that the rating has changed from 65 percent? Perform an appropriate statistical test.

(c) The senator's staff randomly samples 700 people and finds 432 people approve of the senator's job performance. Is there evidence that the rating has changed from 65 percent? Perform an appropriate statistical test.

(d) In part (b) above, suppose the staff suspects the rating has gone down. Is there evidence that the approval rating has slipped down from the 65 percent? Perform an appropriate statistical test

(e) Are the answers from (b) and (c) contradictory? Explain.