6.10   Apartment rental rates. You want to rent an unfurnished one-bedroom apartment for next semester. The mean monthly rent for a random sample of 10 apartments advertised in the local newspaper is $540. Assume that the standard deviation is $80. Find a 95% confidence interval for the mean monthly rent for unfurnished one-bedroom apartments available for rent in this community.

Compare the margin of error for intervals with 90, 95, and 99% confidence:

> Confidence Intervals:
>
> $$\hat{p} \pm z \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$
>
> $$\bar{x} \pm z \frac{\sigma}{\sqrt{n}}$$

Suppose you desire a 90% confidence interval with a *width* of no more than $50. What sample size is needed?

2)

A U.S. Coast Guard survey of 300 small boats in the Cape Cod area found 120 in violation of one or more safety regulations. Give a 99.8% confidence estimate for p, the proportion of all unsafe small boats.

3) The birth process of a newly discovered mammal is being studied, and the lengths of 18 observed pregnancies have been recorded. The mean gestation period was 97.3 days with s = 2.2 days. Find a 95% confidence interval for the mean time of pregnancy for this mammal.

4) The *New York Times* and CBS News conducted a nationwide poll of 1048 randomly selected 13- to 17-year-olds. We can consider the sample to be a SRS.

) Of these 1048 teenagers, 692 had a television in their room. Give a 95% confidence interval for the proportion of all people in this age group who had a TV in their room at the time of the poll

5)

Find n: A researcher wants to determine the 99% confidence interval for the mean number if hours per week that adults spend doing community service. How large of a sample should the researcher select so that the estimate will be within 1 hour of the population mean? Assume that the standard deviation for hours spent per week by adults doing community service is 3.

Answer: $n = 35$