

## Choosing Types of Confidence Intervals

For each problem, identify the inference procedure that is needed to carry out the given interval. Then carry out that procedure.

1. A recent Gallup Poll conducted telephone interviews with a random sample of U.S. adults aged 18 and older. Data were obtained for 1000 people. Of these, 37% said that football is their favorite sport to watch on television. Construct and interpret an 80% confidence interval for  $p$ .
2. A school counselor wants to know how smart the students in her school are. She gets funding from the principal to give an IQ test to an SRS of 60 of the over 1000 students in the school. The mean IQ score in the sample was 114.98 and the standard deviation was 14.80. Construct and interpret a 90% confidence interval for the mean IQ score of all students at the school.
3. A random digit dialing telephone survey of 880 drivers asked, "Recalling the last ten traffic lights you drove through, how many of them were red when you entered the intersections?" Of the 880 drivers, 171 admitted that at least one light had been red. Construct and interpret a 95% confidence interval for the population proportion.
4. Here are measurements (in millimeters) of a critical dimension on an SRS of 16 of the more than 200 auto engine crankshafts produced in one day:

224.120 224.001 224.017 223.982 223.989 223.961 223.960 224.089  
223.987 223.976 223.902 223.980 224.098 224.057 223.913 223.999

- (a) Construct and interpret a 95% confidence interval for the mean measurement of all crankshafts produced in this day.
  - (b) The mean is supposed to be  $\mu = 224$  mm but can drift away from this target during production. Does your interval from part (a) suggest that the mean has drifted away from this value? Explain.
5. Suppose a student measuring the boiling temperature of a certain liquid observes the readings on 6 different random samples of the liquid. She calculates the sample mean to be  $101.82^\circ\text{C}$ , and she knows that the distribution of all readings for this procedure is Normal with a standard deviation of 1.2 degrees Celsius. Construct and interpret the 99% confidence interval for the mean boiling temperature of all readings for this procedure.