

4. A New York Times/CBS News Poll asked a random sample of U.S. adults the questions, "Do you favor an amendment to the Constitution that would permit organized prayer in public schools?" Based on this poll, the 95% confidence interval for the population who favor such an amendment is (0.63, 0.69).
- Interpret the confidence interval.
 - What is the point estimate that was used to create the interval? What is the margin of error?
 - Based on this poll, a reporter claims that more than two-thirds of U.S. adults favor such an amendment. Use the confidence interval to evaluate this claim.
5. Young people have a better chance of full-time employment and good wages if they are good with numbers. How strong are the quantitative skills of young Americans of working age? One source of data is the National Assessment of Educational Progress (NAEP) Young Adult Literacy Assessment Survey, which is based on a nationwide probability sample of households. The NAEP survey includes a short test of quantitative skills, covering mainly basic arithmetic and the ability to apply it to realistic problems. Scores on the test range from 0-500. For example, a person who scores 233 can add the amounts of two checks appearing on a bank deposit slip; someone scoring 325 can determine the price of a meal from a menu; a person scoring 375 can transform a price in cents per ounce into dollars per pound.

Suppose that you give the NAEP test to an SRS of 840 people from a large population in which the scores have mean 280 and standard deviation $\sigma = 60$. The mean \bar{x} of the 840 scores will vary if you take repeated samples.

- Describe the shape, center and spread of the sampling distribution of \bar{x} .

- b. Sketch the sampling distribution of \bar{x} . Mark its mean and the values 1, 2, 3 standard deviations on either side of the mean.
- c. According to the 69-95-99.7 rule, about 95% of all values of \bar{x} lie within a distance m of the mean of the sampling distribution. What is m ? Shade the region on the axis of your sketch that is within m of the mean.
- d. Whenever \bar{x} falls in the region you shaded, the population mean μ lies in the confidence interval $\bar{x} \pm m$. For what percent of all possible samples does the interval capture μ ?
6. A 95% confidence interval of the mean body mass index (BMI) of young American women is 26.8 ± 0.6 . Discuss whether each of the following explanations is correct:
- a. We are confident that 95% of all young women have BMI between 26.2 and 27.4.
- b. We are 95% confident that future samples of young women will have mean BMI between 26.2 and 27.4.
- c. Any value from 26.2 to 27.4 is believable as the true mean BMI of young American women.
- d. If we take many samples, the population mean BMI will be between 26.2 and 27.4 in about 95% of those samples.
- e. The mean BMI of young American women cannot be 28.