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**HW1.** A random sample of 100 adults are asked if they pay for monthly subscriptions that they do not use, like a magazine, app, or online program. Many do, because they have never taken the time to cancel the subscription. A 95% confidence interval for the proportion of adults who to pay for subscriptions they do not use is 0.352 to 0.548.

- a. Interpret the confidence interval.
- b. Calculate the point estimate and the margin of error.
- c. Based upon this survey, a reporter claims that a majority of adults continue to pay for monthly subscriptions they do not use. Use the confidence interval to evaluate this claim.

**HW2.** The P.E. teacher of a large high school wants to estimate the mean number of pushups students at this school can do in one minute. He selects a random sample of 30 students from those who are there after school for sports practices. He records how many pushups each of the students in the sample can do in one minute. He determines that he is 90% confident that the interval from 24.1 to 28.5 captures the mean number of pushups that students at this school can do in one minute.

- a. Interpret the confidence level.
- b. Explain what would happen to the length of the interval if the confidence level were increased to 99%.
- c. How would a 90% confidence interval based on a sample of size 200 compare to the original 90% interval?
- d. Describe one potential source of bias in this study that is not accounted for by the margin of error.

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**HW3.** Starting a nightclub A college student organization wants to start a nightclub for students under the age of 21. To assess support for this proposal, they will select an SRS of students and ask each respondent if he or she would patronize this type of establishment. What sample size is required to obtain a 90% confidence interval with a margin of error of at most 0.04?

**HW4.** A Google search reveals that 21.6% of Skittles are orange and 20% of M&Ms are orange. For the difference between proportions of orange Skittles and M&Ms with sample size  $n=50$ , what is the 95% confidence interval?

- 24.** After deciding on a 95% confidence level, the researcher is deciding between a sample of size  $n = 500$  and a sample of size  $n = 1000$ . Compared with using a sample size of  $n = 500$ , a confidence interval based on a sample size of  $n = 1000$  will be
- a. narrower and would involve a larger risk of being incorrect.
  - b. wider and would involve a smaller risk of being incorrect.
  - c. narrower and would involve a smaller risk of being incorrect.
  - d. wider and would involve a larger risk of being incorrect.
  - e. narrower and would have the same risk of being incorrect.