STATCRUNCH Click on **Open StatCrunch,** then enter or open a data set. Click on **Stat,** then select **Proportion.** Select **One sample,** then select **with summary.** Proceed to enter the number of successes and the number of observations, click on **Next,** then select **Confidence Interval** and use the **Standard-Wald** option.

Sample Size Determination

STATDISK Select **Analysis,** then **Sample Size Determination,** then **Estimate Proportion.** Enter the required items in the dialog box.

MINITAB 16 Minitab Release 16 has a procedure for determining sample size using the binomial distribution, not the normal approximation to the binomial distribution, so results will not agree with those found by using the methods of this section. For Minitab's procedure, select **Stat, Power and Sample Size,** then select **Sample Size for Estimation** and choose the menu item of **Proportion (Binomial).** Complete the dialog box and click **OK.**

Sample size determination is not available as a built-in function with Excel or StatCrunch or the TI-83/84 Plus calculator.

7-2 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

1. Poll Results in the Media *USA Today* provided a "snapshot" illustrating poll results from 1910 professionals who interview job applicants. The illustration showed that 26% of them said the biggest interview turnoff is that the applicant did not make an effort to learn about the job or the company. The margin of error was given as ± 3 percentage points. What important feature of the poll was omitted?

2. Margin of Error For the poll described in Exercise 1, describe what is meant by the statement that "the margin of error is ± 3 percentage points."

3. Notation For the poll described in Exercise 1, what do $\hat{p}$, $\hat{q}$, n, E, and p represent? If the confidence level is 95%, what is the value of α?

4. Confidence Levels Given specific sample data, such as the data given in Exercise 1, which confidence interval is wider: the 95% confidence interval or the 80% confidence interval? Why is it wider?

Finding Critical Values. ***In Exercises 5–8, find the indicated critical z value.***

5. Find the critical value $z_{\alpha/2}$ that corresponds to a confidence level of 80%.

6. Find the critical value $z_{\alpha/2}$ that corresponds to a 99% confidence level.

7. Find $z_{\alpha/2}$ for $\alpha = 0.10$.

8. Find $z_{\alpha/2}$ for $\alpha = 0.04$.

Formats of Confidence Intervals. ***In Exercises 9–12, express the confidence interval using the indicated format. (The confidence intervals are based on the proportions of red, orange, yellow, and blue M&Ms in Data Set 20 from Appendix B.)***

9. Express the confidence interval $0.0641 < p < 0.186$ in the form of $\hat{p} \pm E$.

10. Express the confidence interval $0.165 < p < 0.335$ in the form of $\hat{p} \pm E$.

11. Express the confidence interval (0.0268, 0.133) in the form of $\hat{p} - E < p < \hat{p} + E$.

12. Express the confidence interval 0.270 ± 0.087 in the form of $\hat{p} - E < p < \hat{p} + E$.

Constructing and Interpreting Confidence Intervals. ***In Exercises 13–16, use the given sample data and confidence level. In each case, (a) find the best point estimate of the population proportion p; (b) identify the value of the margin of error E; (c) construct the confidence interval; (d) write a statement that correctly interprets the confidence interval.***

13. From a KRC Research poll in which respondents were asked if they felt vulnerable to identify theft: $n = 1002$, $x = 531$ who said "yes." Use a 95% confidence level.