4. Interpreting a Control Chart After constructing a control chart for the proportions of defective dimes, it is concluded that the process is within statistical control. Does that imply that almost all of the dimes meet the desired specifications? Explain.

Control Charts for *p*. ***In Exercises 5–12, use the given process data to construct a control chart for p. In each case, use the three out-of-control criteria listed in Section 14-2 and determine whether the process is within statistical control. If it is not, identify which of the three out-of-control criteria apply.***

5. Defective Dimes Consider a process of minting dimes. Listed below are the numbers of defective dimes in successive batches of 10,000 randomly selected on consecutive days of production.

32 21 25 19 35 34 27 30 26 33

6. Defective Dimes Repeat Exercise 5 assuming that the size of each batch is 100 instead of 10,000. Compare the control chart to the one found for Exercise 5. Comment on the general quality of the manufacturing process described in Exercise 5 compared to the manufacturing process described in this exercise.

7. Birth Rate In recent and consecutive years, 100,000 people were randomly selected and the numbers of births they generated were found, with the results given below. (The listed values are based on data from the *CIA World Factbook*, and they are the most recent values available at the time of this writing.)

1422 1410 1414 1415 1413 1414 1414 1416 1418 1382 1383 1383

8. Violent Crimes In each of recent and consecutive years, 100,000 people in the United States were randomly selected and the number who were victims of violent crime was determined, with the results listed below. Does the rate of violent crime appear to exhibit acceptable behavior? (The values are based on data from the U.S. Department of Justice, and they are the most recent values available at the time of this writing.) How does the result affect us?

685 637 611 566 523 507 505 494
476 463 469 474 467 458 429

9. Voting Rate In each of recent and consecutive years of presidential elections, 1000 people of voting age in the United States were randomly selected and the number who voted was determined, with the results listed below. (The data are the latest available as of this writing.) Comment on the voting behavior of the population.

631 619 608 552 536 526 531 501 551 491 513 553 568

10. College Enrollment by High School Graduates In each of several recent and consecutive years, 1000 high school graduates were randomly selected and the numbers who enrolled in college were recorded (based on data from the *Statistical Abstract of the United States*). The data are the latest available as of this writing. Does the process appear to be proceding as it should?

626 619 619 650 670 656 629 633 618
652 639 672 686 660 672 690 693 681

11. Cola Cans In each of several consecutive days of production of cola cans, 500 cans are tested and the numbers of defects each day are listed below. What action should be taken?

20 22 19 17 19 15 16 13 14 14
11 13 12 11 10 9 9 10 7 7