

For Exercises 5 through 19, perform these steps.

- State the hypotheses and identify the claim.
- Find the critical value.
- Compute the test value.
- Make the decision.
- Summarize the results.

Use the traditional method of hypothesis testing unless otherwise specified.

5. A staff member of an emergency medical service wishes to determine whether the number of accidents is equally distributed during the week. A week was selected at random, and the following data were obtained. Is there evidence to reject the hypothesis that the number of accidents is equally distributed throughout the week, at $\alpha = 0.05$?

Day	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
No. of accidents	28	32	15	14	38	43	19

6. A children's raincoat manufacturer wants to know whether customers prefer any specific color over other colors in children's raincoats. He selects a random sample of 50 raincoats sold and notes the colors. The data are shown here. At $\alpha = 0.10$, is there a color preference for the raincoats?

Color	Yellow	Red	Green	Blue
No. sold	17	13	8	12

7. In a recent study, the following percentages of U.S. retail car sales based on size were reported: 28.1% small, 47.8% midsize, 7% large, and 17.1% luxury. A recent survey of retail sales in a particular county indicated that of 100 cars sold, 25 were small, 50 were midsize, 10 were large, and 15 were luxury cars. At $\alpha = 0.05$, is there sufficient evidence to conclude that the proportions differ from those stated in the report?

Source: *N.Y. Times Almanac*.

8. According to a recent census report, 68% of families have two parents present, 23% have only a mother present, 5% have only a father present, and 4% have no parent present. A random sample of families from a large school district revealed these results:

Two parents	Mother only	Father only	No parent
120	40	30	10

Is there sufficient evidence to conclude that the proportions of families by type of parent(s) present differ from those reported by the census?

Source: *N.Y. Times Almanac*.

9. An ABC News poll asked adults whether they felt genetically modified food was safe to eat. Thirty-five percent felt it was safe, 52% felt it was not safe, and 13% had no opinion. A random sample of 120 adults was asked

the same question at a local county fair. Forty people felt that genetically modified food was safe, 60 felt that it was not safe, and 20 had no opinion. At the 0.01 level of significance, is there sufficient evidence to conclude that the proportions differ from those reported in the survey?

Source: ABCNews.com Poll, www.pollingreport.com

10. A recent survey asked adults nationwide if they thought that the federal government should continue to fund NASA's efforts to send unstaffed missions to Mars. Fifty-six percent said they should continue, 40% said that they should not continue, and 4% had no opinion. A random sample of 200 college students resulted in these numbers:

- Should continue: 126
- Should not continue: 65
- No opinion: 9

Is there sufficient evidence at $\alpha = 0.05$ to conclude that the opinions of the college students differ from those of the report?

Source: CNN/USA TODAY/Gallup Poll, www.pollingreport.com

11. *USA TODAY* reported that 21% of loans granted by credit unions were for home mortgages, 39% were for automobile purchases, 20% were for credit card and other unsecured loans, 12% were for real estate other than home loans, and 8% were for other miscellaneous needs. In order to see if her credit union customers had similar needs, a manager surveyed a random sample of 100 loans and found that 25 were for home mortgages, 44 for automobile purchases, 19 for credit card and unsecured loans, 8 for real estate other than home loans, and 4 for miscellaneous needs. At $\alpha = 0.05$, is the distribution the same as reported in the newspaper?

Source: *USA TODAY*.

12. Nationwide the shares of carbon emissions for the year 2000 are transportation, 33%; industry, 30%; residential, 20%; and commercial, 17%. A state hazardous materials official wants to see if her state is the same. Her study of 300 emissions sources finds transportation, 36%; industry, 31%; residential, 17%; and commercial, 16%. At $\alpha = 0.05$, can she claim the percentages are the same?

Source: Energy Information Administration/*New York Times*.

13. A *USA TODAY* Snapshot states that 53% of adult shoppers prefer to pay cash for purchases, 30% use checks, 16% use credit cards, and 1% have no preference. The owner of a large store randomly selected 800 shoppers and asked their payment preferences. The results were that 400 paid cash, 210 paid by check, 170 paid with a credit card, and 20 had no preference. At $\alpha = 0.01$, test the claim that the owner's customers have the same preferences as those surveyed.

Source: *USA TODAY*.