

**20. Twitter Poll** The Pew Research Center conducted a survey of 1007 adults and found that 856 of them know what Twitter is. Use a 0.01 significance level to test the claim that more than 75% of adults know what Twitter is.

**21. Overtime Rule in Football** In “The Overtime Rule in the National Football League: Fair or Unfair?” by Gorgievski et al., *MathAMATYC Educator*, Vol. 2, No. 1, the authors report that among 414 football games won in overtime, 235 were won by the team that won the coin toss at the beginning of overtime. Using a 0.05 significance level, test the claim that the coin toss is fair in the sense that neither team has an advantage by winning it.

**22. Testing Effectiveness of Nicotine Patches** In one study of smokers who tried to quit smoking with nicotine patch therapy, 39 were smoking one year after the treatment and 32 were not smoking one year after the treatment (based on data from “High-Dose Nicotine Patch Therapy,” by Dale et al., *Journal of the American Medical Association*, Vol. 274, No. 17). Use a 0.05 significance level to test the claim that among smokers who try to quit with nicotine patch therapy, the majority are smoking a year after the treatment. What do these results suggest about the effectiveness of nicotine patch therapy for those trying to quit smoking?

**23. Smartphone Users** A RingCentral survey of 380 smartphone users showed that 152 of them said that their smartphone is the only thing they could not live without. Use a 0.01 significance level to test the claim that fewer than half of smartphone users identify the smartphone as the only thing they could not live without. Do these results apply to the general population?

**24. Postponing Death** An interesting and popular hypothesis is that individuals can temporarily postpone death to survive a major holiday or important event such as a birthday. In a study of this phenomenon, it was found that there were 6062 deaths in the week before Thanksgiving, and 5938 deaths the week after Thanksgiving (based on data from “Holidays, Birthdays, and Postponement of Cancer Death,” by Young and Hade, *Journal of the American Medical Association*, Vol. 292, No. 24). If people can postpone death until after Thanksgiving, then the proportion of deaths in the week before should be less than 0.5. Use a 0.05 significance level to test the claim that the proportion of deaths in the week before Thanksgiving is less than 0.5. Based on the result, does there appear to be any indication that people can temporarily postpone death to survive the Thanksgiving holiday?

**25. Online Books** A *Consumer Reports* Research Center survey of 427 women showed that 29.0% of them purchase books online. Test the claim that more than 25% of women purchase books online.

**26. Job Interviews** In a Harris poll of 514 human resource professionals, 45.9% said that body piercings and tattoos were big grooming red flags. Use a 0.01 significance level to test the claim that less than half of all human resource professionals say that body piercings are big grooming red flags.

**27. Job Interviews** In a Harris poll of 514 human resource professionals, 90% said that the appearance of a job applicant is most important for a good first impression. Use a 0.01 significance level to test the claim that more than  $\frac{3}{4}$  of all human resource professionals say that the appearance of a job applicant is most important for a good first impression.

**28. Misleading Survey Responses** Voting records show that 61% of eligible voters actually did vote in a recent presidential election. In a survey of 1002 people, 70% said that they voted in that election (based on data from ICR Research Group). Use the survey results to test the claim that the percentage of all voters who say that they voted is equal to 61%. What do the results suggest?

**29. Bias in Jury Selection** In the case of *Casteneda v. Partida*, it was found that during a period of 11 years in Hidalgo County, Texas, 870 people were selected for grand jury duty and 39% of them were Americans of Mexican ancestry. Among the people eligible for grand jury duty, 79.1% were Americans of Mexican ancestry. Use a 0.01 significance level to test the