1. According to the U.S. Bureau of Labor Statistics, the average weekly earnings of a production worker in 1997 were $421.20. Suppose a labor wants to test to determine whether this figure is still accurate today. The researcher randomly selects 60 production workers from across the United States and obtains a representative earning statement for one week from each. The resulting sample average is $435.70. Assuming a population standard deviation of $33, and a 5% level of significance, determine whether the mean weekly earning of a population worker has changed.
2. According to a study several years ago by the Personal Communication Industry Association, the average wireless phone user earns $62,600 per year. Suppose a researcher believes that the average annual earning of wireless phone user are lower now, and he sets up a study in an attempt to prove this theory. He randomly samples 18 wireless phone users and finds out that the average annual salary for this sample is $58,974, with a population standard deviation of $7,810. Use α = 0.01 level of significance to test the researcher’s theory. Assume wages in this industry are normally distributed.
3. A manufacturing company produces valves in various sizes and shapes. One particular valve plate is supposed to have a tensile strength of 6 pounds per millimeter (lbs/mm). The company tests a random sample of 50 such valve plates from a lot of 650 valve plates. The sample mean is a tensile strength of 5.3611 lbs/mm, and the population standard deviation is 0.2903 lbs/mm. use 0.10 significance level and test to determine whether the lot of valve plates has an average tensile strength of 6lbs/mm.
4. According to a report released by CIBC entitled “Women Entrepreneurs: Leading the Charge,” the average age for Canadian businesswomen in 2008 was 4.1. In the report, there was some indication that researcher believed that this mean age will increase. Suppose now, a few years later, business researchers in Canada want to test to determine if, indeed, the mean age of a Canadian businesswomen has increased. The researcher randomly sample 97 Canadian businesswomen and ascertain that the sample mean age is 43.4. From past experience, it is know that the population standard deviation is 8.95. Test to determine if the mean age of a Canadian businesswomen has increased, using a 1% level of significance. What is the p-value for this test? What is the decision? If the null hypothesis is rejected, is the result substantive?
5. A hole-punch machine is set to punch a hole 1.9 centimeters in diameter in a strip of sheet metal in a manufacturing process. The strip of metal is then creased and sent on to the next phase of production, where a metal rod is slipped through the hole. It is punching accuracy; technicians have randomly sampled 10 punched holes and measured the diameters. The data (in centimeters) follow. Use an alpha of 0.10 to determine whether the holes are being punched an average of 1.9 centimeters. Assume the punched holes are normally distributed in the population.
6. Suppose that in past years the average price per square foot for warehouses in the United States has been $33. A national real estate investor wants to determine whether that figure has changed now. The investor hires a researcher who randomly samples 51 warehouses that are for sale across the United States and finds that the mean price per square foot is $32.67, with a standard deviation of $1.3. Assume that prices of warehouse footage are normally distributed in population. If the researcher uses a 5% level of significance, what statistical conclusion can be reached? What are the hypotheses?
7. According to data released by the World Bank, the mean PM10 (particulate matter) concentration for the city of Kabul, Afghanistan, in 1999 was 46. Suppose that because of efforts to improve air quality in Kabul, increases in modernization, and efforts to establish environment-friendly business, city leaders believe rates of particulate matter in Kabul have decreased. To test this notion, they randomly sample 12 readings over a one-year period with the resulting shown below. Do these data present enough evidence to determine that PM10 readings are significantly less now in Kabul? Assume that particulate readings are normally distributed and that α = 0.01.

31 44 35 53 57 47 32 40 31 38 53 45

1. A study by Hewitt Associates showed that 79% o companies offer employees flexible scheduling. Suppose a researcher believes that in accounting firms this figure is lower. The researcher randomly selects 415 accounting firms and through interviews determines that 303 of these firms have flexible scheduling. With a 1% level of significance, does the test show enough evidence to conclude that a significantly lower proportion of accounting firms offer employee flexible scheduling?
2. A large manufacturing company investigated the service it received from suppliers and discovered that, in the past, 32% of all materials shipments were received late. However, the company recently installed a just-in-time system in which suppliers are linked more closely to the manufacturing process. A random sample of 120 deliveries since the just-in-time system was installed reveals that 24 deliveries were late. Use this sample information to test whether the proportion of late deliveries was reduced significantly. Use 5% level of significance.
3. Where do CFOs get their money news? According to Robert Half International, 47% get their money news from newspapers, 15% get it from communication/colleagues, 12% get it from television, 11% from the internet, 9% from magazines, 5% from radio, and 1% don’t know. Suppose a researcher wants to test these results. She randomly samples 67 CFOs and finds that 40 of them get their money news from newspapers. Does the test show enough evidence to reject the findings of Robert Half International? Use 5% level of significance.