

conduct a survey of American drivers who see humor in the Juke name, how many American drivers must you survey? Assume that you want 97% confidence that your sample percentage is in error by no more than two percentage points. Is it OK to save money by conducting a telephone survey using only local phone numbers? Why or why not?

9. Normal Distribution Based on the measurements in Data Set 1 of Appendix B, assume that heights of women are normally distributed with a mean of 162.0 cm and a standard deviation of 6.6 cm.

- If a woman is randomly selected, find the probability that she is taller than 152.1 cm.
- If four women are randomly selected, find the probability that their mean height is greater than 152.1 cm.
- Find P_{80} .

10. Mean Income Another (clearly inferior) statistics textbook includes an exercise in which students are given the mean income for each of the 50 states. The students are then asked to compute the mean of those 50 values. Is the result the mean income for the U.S. population? Why or why not?

Technology Project

STATDISK, Minitab, Excel, StatCrunch, the TI 83-84 Plus calculator, and many other statistical software packages are all capable of generating normally distributed data drawn from a population with a specified mean and standard deviation. In Example 3 of Section 6-2, we noted that bone density test scores are measured as z scores having a normal distribution with a mean of 0 and a standard deviation of 1. Generate two sets of sample data that represent simulated bone density scores, as shown below.

Bone Density Scores of Treatment Group: Generate 10 sample values from a normally distributed population with mean 0 and standard deviation 1.

Bone Density Scores of Placebo Group: Generate 15 sample values from a normally distributed population with mean 0 and standard deviation 1.

STATDISK: Select **Data**, then select **Normal Generator**.

Minitab: Select **Calc**, **Random Data**, **Normal**.

Excel: If using Excel 2013, 2010, or 2007, select **Data**; if using Excel 2003, select **Tools**. Select **Data Analysis**, **Random Number Generator**, and be sure to select **Normal** for the distribution.

TI-83/84 Plus: Press **MATH**, select **PRB**, then select **randNorm** and enter the mean, standard deviation, and the number of data values in the format of (\bar{x}, s, n) .

StatCrunch: Click on **Data**, then click on **Simulate Data**, then select the menu item of **Normal**. In the dialog box, enter 10 for the number of rows, and enter 1 for the number of columns. Click on **Simulate**. Repeat this process using 15 for the number of rows.

Because each of the two samples consists of random selections from a normally distributed population with a mean of 0 and a standard deviation of 1, the data are generated so that both data sets really come from the same population, so there should be no difference between the two sample means.

- After generating the two data sets, use a 0.10 significance level to test the claim that the two samples come from populations with the same mean.
- If this experiment is repeated many times, what is the expected percentage of trials leading to the conclusion that the two population means are different? How does this relate to a type I error?