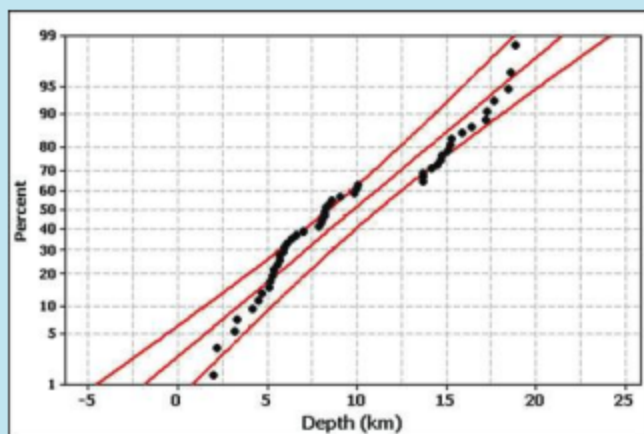


MINITAB Minitab can generate a graph similar to the normal quantile plot described in this section. Minitab's procedure is somewhat different, but the graph can be interpreted by using the same criteria given in this section. That is, normally distributed data should lie reasonably close to a straight line, and points should not reveal a pattern that is not a straight-line pattern. First enter the values in column C1 or open a data set, then select **Stat, Basic Statistics, and Normality Test**. Enter C1 for the variable, then click on **OK**.

Minitab can also generate a graph that includes boundaries. If the points all lie within the boundaries, conclude that the values are normally distributed. If points lie beyond the boundaries, conclude that the values are not normally distributed. To generate the graph that includes the boundaries, first enter the values in column C1, select the main menu item of **Graph**, select **Probability Plot**, then select the option of **Simple**. Proceed to enter C1 for the variable, then click **OK**. The accompanying Minitab display is based on the 50 earthquake depths (km) listed in Data Set 16 from Appendix B, and it includes the boundaries. See that there are points lying outside of the boundaries, suggesting that the data are not from a population having a normal distribution.

MINITAB



EXCEL Use XLSTAT. Click on **XLSTAT**, then click on **Describing Data**, then select **Normality Tests**. In the Data box, enter the range of data, such as A1:A50. Put a check in the "Sample labels" box only if the first cell includes a name for the data. Click on the **Charts** tab and be sure that there is a checkmark next to the "Normal Q-Q Plot" box. Click **OK** and proceed to get the graph.

TI-83/84 PLUS The TI-83/84 Plus calculator can be used to generate a normal quantile plot, and the result is consistent with the procedure described in this section. First enter the sample data in list L1. Press **2ND** **Y=** (for **STAT PLOT**), then press **ENTER**. Select **ON**, select the "type" item, which is the last item in the second row of options, and enter **L1** for the data list. The screen should appear as shown here. After making all selections, press **ZOOM**, then **9**, and the points in the normal quantile plot will be displayed.

TI-83/84 PLUS



STATCRUNCH Click on **Open StatCrunch**, then enter or open a column of sample data. Click on **Graphics**, then select the menu item of **QQPlot**. In the dialog box that appears, select the column to be used, then click on **Create Graph**. The result will be similar to the normal quantile plot described in this section, but the axes will be switched. The interpretation will be the same as described in this section.

6-6 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

1. Normal Quantile Plot Data Set 1 in Appendix B includes the heights of 40 randomly selected women. If you were to construct a histogram of those heights, what shape do you expect the histogram to have? If you were to construct a normal quantile plot of those heights, what pattern would you expect to see in the graph?

2. Normal Quantile Plot After constructing a histogram of the ages of the 40 women included in Data Set 1 in Appendix B, you see that the histogram is far from being bell-shaped. What do you now know about the normal quantile plot?

3. Small Sample An article includes elapsed times (hours) to lumbar puncture for 19 patients who entered emergency rooms with sudden and severe "thunderclap" headaches (based on data from "Thunderclap Headache and Normal Computed Tomographic Results: Value of Cerebrospinal Fluid Analysis," by DuPont et al., *Mayo Clinic Proceedings*, Vol. 83, No. 12). Given that the sample size is less than 30, what requirement must be met in order to treat the sample mean as a value from a normally distributed population? Identify three ways of verifying that requirement.