1) Create a sequence, \( x \), from -10 to 10 with spacing 0.5.
   a) Create a vector, \( y \), containing the squares of \( x \).
   b) Make a scatterplot of the two vectors.
   c) Reproduce additional scatterplots by changing its arguments, like \( \text{type} \), \( \text{xlab} \), \( \text{ylab} \), \( \text{lwd} \), \( \text{col} \).

2) Plot a pie chart with 15 colors on the background color, color 0, for a total of 16 colors. This pie chart is of particular interest as the default color map for graphsheet has sixteen colors: fifteen foreground and one background color. So, this chart can be used to see all the colors in the default color map.

3) Plot \( \sin(x) \) against \( x \), using 200 values of \( x \) between \(-\pi\) and \( \pi \), but do not plot any axes yet (use parameter \( \text{axes=F} \) in the call to plot). Add an \( y \)-axis passing through the origin using the “extended” style and horizontal labels. Add an \( x \)-axis with tick-marks from \(-\pi\) to \( \pi \) in increments of \( \pi/4 \), twice the usual length.

4) Try out the various graphics features. To do so, use the following S-Plus commands to generate an easily-reproducible graphic:

   ```R
   > data(USArrests)
   > attach(USArrests)
   > plot(UrbanPop, Murder, type="n", main="Plot of US Arrests for Murder")
   > points(UrbanPop, Murder, pch="*", col=2)
   > lines(lowess(UrbanPop, Murder), lty=2, col=3)
   > legend(30, 18, c("Color 1", "Color 2", "Color 3"), pch="*",
           lty=c(1, 2, 3), col=2)
   ```

   Try to understand this commands and play around with its arguments.

5) The data frame \texttt{survey} from the data set \texttt{survey} contains the results of a survey of 237 first-year Statistics students at Adelaide University. It is an data frame that comes with all version of \texttt{R}. This data is taken from Venables and Ripley (1999).
   a) Use the \texttt{summary} command to look at the data set. How many variables are in it??
   b) For a graphical summary of all the variables, use \texttt{plot(survey)}. What kind of plots are produced?
c) One component of this data frame, Exer, is a factor object containing the responses to a question asking how often the students exercised. Produce a barchart of these responses.

d) Use table and pie (or piechart) to create a pie chart of the responses. Do you like this better than the barplot? Which is more informative? Which gives a better picture of exercise habits of students?

e) The pie function takes an argument names which can be used to put labels on each pie slice. Redraw the pie chart with labels.

f) Alternatively, you could add a legend to identify the slices.

g) Try c)-f) for the Smoke variable, which records responses to the question: “How often do you smoke?” Hint: note that table and levels ignore missing values; if you wish to include nonrespondents in your chart use summary to generate the values, and names on the summary object to generate the labels.