Lists and Statistics on the TI-83/4

Braking Distance This problem will use the following data from the US Bureau of Public Roads. Given a car driving at a certain speed, two measurements are taken to see how far the car travels before stopping. The Driver Reaction Distance measures how much distance is covered between the time a person realizes that they need to stop and when they actually step on the brake. The Average Braking Distance measures how far a car travels after the brake is applied before the car stops.

Speed (mph)	Driver Reaction Distance (ft)	Average Braking Distance (ft)
20	22	20
25	28	28
30	33	40.5
35	39	52.5
40	44	72
45	50	92.5
50	55	118
55	61	148.5
60	66	182
65	72	220.5
70	77	266
75	83	318
80	88	376

- Enter your data into your calculator and graph it using on two separate scatter plots. Sketch the graphs below.

- Use the linear regression option to find a ***line*** that best fits *each* set of data. Write down the equation for each line.

  Driver Reaction Distance *y* as a function of speed *x*: _____

  Average Braking Distance *y* as a function of speed *x*: _____

- Graph both the line and the data on your calculator to see how well they fit for each set [You don't need to sketch it].

  Which, if any, of the data sets is approximated well by a line? _____

- Look at scatter plot with the line for the second set of data for the Average Braking Distance as a function of speed. Is there something there to suggest that a straight line isn't the best description of the data.

  What other simple functions might be better? _____

- Use the built-in statistical calculations to perform a regression using a function other than linear.

  What type of regression did you use? _____

  What is the resulting best-fit curve? _____

- Plot the data along with this new best-fit curve and sketch the graph below.

- Does it seem to fit the data better? _____

- **IF** you don't think you chose a the correct type of fit, what type of function do you think would better describe the relationship between the speed of the car and distance it takes for the car to brake?_____