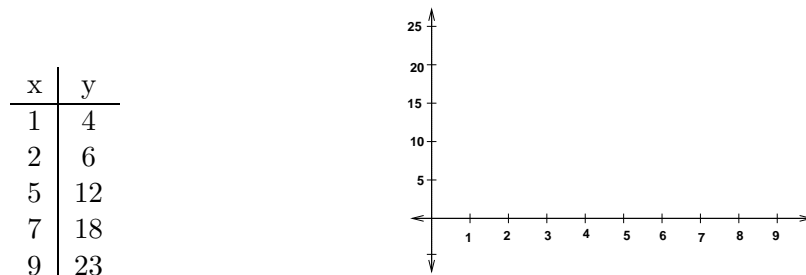


Section 1.3: Linear Regression

Regression is the method of finding the best fitting formula for a data set. **Note:** Best fitting does not always mean that the formula goes through each data point.

Create a scatter plot for this data set.



Calculator commands for regression:

Entry of data into the calculator:

Press $\boxed{\text{STAT}} \boxed{\text{ENTER}}$. This puts you in the edit menu. Enter the data into lists $x = L_1$ and $y = L_2$. If you choose any other list, just make the appropriate changes below. If some or all of the list are gone, you can get them back by pressing $\boxed{\text{STAT}} \boxed{5} \boxed{\text{ENTER}}$. To clear out a list, arrow up to the top of the list (highlighting its name) and press $\boxed{\text{CLEAR}} \boxed{\text{ENTER}}$.

Creating a Scatter plot:

Step 1. Enter the data into the calculator.

Step 2. To set up the stat plots press $\boxed{2\text{nd}} \boxed{\text{Y=}}$. Choose your plot and make sure that it is on, x-list = L_1 , y-list = L_2 , and the type is the first graph on the first line. Once this is set up you can turn it on and off from the top of the $\boxed{\text{Y=}}$ screen. This setup needs to be done only once (unless your calculator is reset).

Step 3. Press $\boxed{\text{ZOOM}} \boxed{9}$ (ZoomStat) to graph the scatter plot. This will have the calculator choose the window settings.

Regression:

Once you decide the type of regression needed, press $\boxed{\text{STAT}} \boxed{\blacktriangleright}$ to get the calculate menu for the stat commands. Now use the down arrow to select the method of regression.

For example, select linear regression at choice 4: $\text{LinReg}(ax + b)$.

Now the calculator needs to know which lists contain the data. The calculator always assumes that the x-values are in L_1 and the y-values are in L_2 . If this is the case, then press enter and the calculator will compute the regression equation. If your data is in any other list, then you will need to specify the lists. The list can be indicated by pressing $\boxed{2\text{nd}}$ and any of the numbers 1 to 6.

For example if the x-values were in L_2 and the y-values were in L_3 then after selecting the regression method press $\boxed{2\text{nd}} \boxed{2} \boxed{,} \boxed{2\text{nd}} \boxed{3}$. On the screen you should now see:

LinReg(ax+b) L_2, L_3

1. The number of applications to medical schools in the United States increased rapidly from 1988 to 1994 as indicated by the data in the table. Years are represented by their last two digits and applications are given in thousands.

Year	1988	1989	1990	1991	1992	1994
Applications	27	27	29	33	37	45

(a) Look at a scatter plot and decide if a line is a good model for the data.

(b) Find the regression line(least squares line).

(c) Predict the number of applications in the year 1990.

(d) In what year would the number of applications be 79,500?

2. The average cost of a New house(in thousand of dollars) is given by the following table. Find a linear regression model and interpret the slope.

Year	1973	1978	1983	1988	1993	1998
Value	36	63	90	138	148	182