B–11 Creating Scatter Plots and Determining Lines and Curves of Best Fit Using Regression

This table gives the height of a baseball above ground, from the time it was hit to the time it touched the ground.

Time (s)	0	1	2	3	4	5	6
Height (m)	2	27	42	48	43	29	5

Create a scatter plot of the data.

1. **Enter the data into lists.** To start press [STAT] [ENTER]. Move the cursor over to the first position in **L1** and enter the values for time. Press [ENTER] after each value. Repeat this for height in **L2**.

2. **Create a scatter plot.** Press [2nd] [Y=] and [1] [ENTER]. Turn on Plot 1 by making sure the cursor is over **On**, the **Type** is set to the graph type you prefer, and **L1** and **L2** appear after **Xlist** and **Ylist**.

3. **Display the graph.** Press [ZOOM] [9] to activate **ZoomStat**.

4. **Apply the appropriate regression analysis.** To determine the equation of the line or curve of best fit press [STAT] and scroll over to **CALC**. Press:

   [4] to enable **LinReg(ax+b)**

   [5] to enable **QuadReg**.

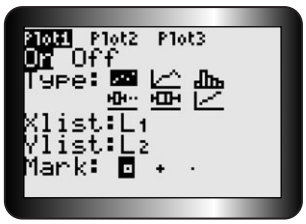
   [0] to enable **ExpReg**.

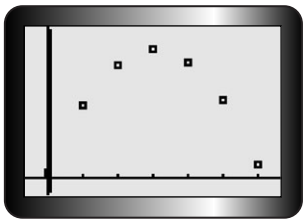
   [ALPHA] [C] to enable **SinReg**.

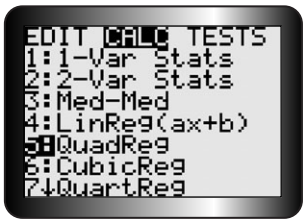
   Press [2nd] [1] [,] [2nd] [2] [,] [VARS]. Scroll over to **Y-VARS**. Press [1] twice. This action stores the equation of the line or curve of best fit into **Y1** of the equation editor.

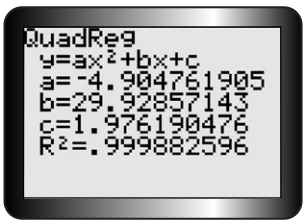
5. **Display and analyze the results.**

   Press [ENTER]. In this case, the letters a, b, and c are the coefficients of the general quadratic equation $y = ax^2 + bx + c$ for the curve of best fit. R^2 is the percent of data variation represented by the model. In this case, the equation is about $y = -4.90x^2 + 29.93x + 1.98$.

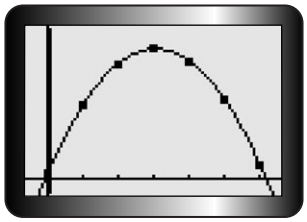








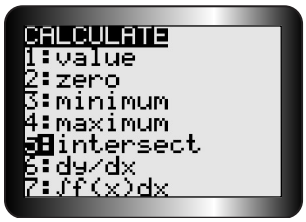
Note: In the case of linear regression, if r is not displayed, turn on the diagnostics function. Press [2nd] [0] and scroll down to **DiagnosticOn**. Press [ENTER] twice. Repeat steps 4 to 6.



6. **Plot the curve.**

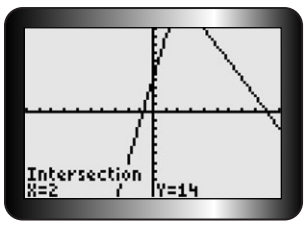
   Press [GRAPH]

B–12 Finding the Points of Intersection of Two Functions



1. **Enter both functions into the equation editor.** In this case we will use $y = 5x + 4$ and $y = -2x + 18$.
2. **Graph both functions**. Press [GRAPH]. Adjust the window settings until the point(s) of intersection are displayed.
3. **Use the intersect operation.**

   Press [2nd] [TRACE] [5].

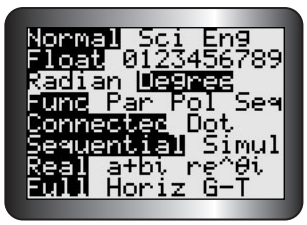


4. **Determine a point of intersection**. You will be asked to verify the two curves and enter a guess (optional) for the point of intersection. Press [ENTER] after each screen appears.

   The point of intersection is exactly (2, 14).

5. **Determine any additional points of intersection.** Press [TRACE] and move the cursor close to the other point you wish to identify. Repeat step 4.

B–13 Evaluating Trigonometric Ratios and Finding Angles

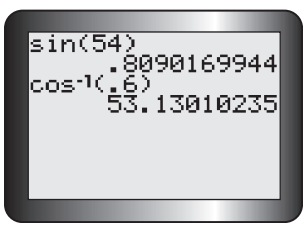


1. **Put the calculator in degree mode.**

   Press [MODE]. Scroll down and across to Degree. Press [ENTER].

2. **Use the [SIN], [COS], or [TAN] key to calculate trigonometric ratios.**

   To find the value of sin 54°, press [SIN] [5] [4] [)] [ENTER].



3. **Use SIN^{-1}, COS^{-1}, or TAN^{-1} to calculate angles.**

   To find the angle whose cosine is 0.6, press [2nd] [COS] [.] [6] [)] [ENTER].