Table 1.12 records the low and high daily temperatures observed on 9/9/1999 in 20 major American cities. Find a function that approximates the high temperature (y) as a function of the low temperature (x). Use this function to predict the high temperature that day for Madison, WI, given that the low was 46.

Place the two lists into your calculator

Table 1.12 Temperature on 9/9/99

City	Low	High	City	Low	High
New York, NY	70	86	Miami, FL	76	92
Los Angeles, CA	62	80	Honolulu, HI	70	85
Chicago, IL	52	72	Seattle, WA	50	70
Houston, TX	70	94	Jacksonville, FL	67	89
Philadelphia, PA	68	86	Baltimore, MD	64	88
Albuquerque, NM	61	86	St. Louis, MO	57	79
Phoenix, AZ	82	106	El Paso, TX	62	90
Atlanta, GA	64	90	Memphis, TN	60	86
Dallas, TX	65	87	Milwaukee, WI	52	68
Detroit, MI	54	76	Wilmington, DE	66	84

Source: AccuWeather, Inc.

Functions from Data

Constructing a Function from Data

Given a set of data points of the form (x, y), to construct a formula that approximates y as a function of x:

1. Make a scatter plot of the data points. The points do not need to pass the vertical line test.
2. Determine from the shape of the plot whether the points seem to follow the graph of a familiar type of function (line, parabola, cubic, sine curve, etc.).
3. Transform a basic function of that type to fit the points as closely as possible.

These graphs are only examples, as they can vary in shape and orientation. (For example, any of the curves could appear upside-down.) The grapher uses various strategies to fit these curves to the data, most of them based on combining function composition with linear regression. Depending on the regression type, the grapher may display a number r called the **correlation coefficient** or a number r^2 or R^2 called the **coefficient of determination**. In either case, a useful "rule of thumb" is: *the closer the absolute value of this number is to 1, the better the curve fits the data.*

DISPLAYING DIAGNOSTICS

If your calculator is giving regression formulas but not displaying the values of r or r^2 or R^2, you may be able to fix that. Go to the CATALOG menu and choose a command called "DiagnosticOn." Enter the command on the home screen and see the reply "Done." Your next regression should display the diagnostic values.

Linear Regression matching activity

- Match each parent function
- with the correct graph and
- with the word problem situations associated with them
- Complete the blog assignment when done!