

11.5 Choose the Best Model for Two-Variable Data

TEKS 2A.1.B



- Before** You wrote different types of functions to model sets of data.
- Now** You will choose the best model to represent a set of data.
- Why?** So you can relate engine speed and horsepower, as in Ex. 14.

Key Vocabulary

- **linear function**, p. 75
- **quadratic function**, p. 236
- **cubic function**, p. 337
- **exponential function**, p. 478
- **power function**, p. 531

You have used the functions shown at the right to model sets of data.

To find the best model for a set of data pairs (x, y) , make a scatter plot of the data and determine the type of function suggested by the pattern in the data points. Then find a model of this type using one of the regression features of a graphing calculator.

Function	General form
Linear	$y = ax + b$
Quadratic	$y = ax^2 + bx + c$
Cubic	$y = ax^3 + bx^2 + cx + d$
Exponential	$y = ab^x$
Power	$y = ax^b$

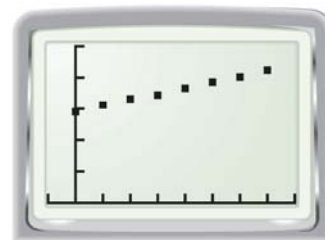
EXAMPLE 1 Use a linear model

TUITION The table shows the average tuition y (in dollars) for a private four-year college in the United States from 1995 to 2002, where x is the number of years since 1995. Use a graphing calculator to find a model for the data.

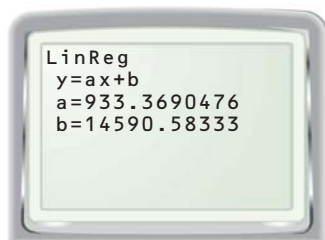
x	0	1	2	3	4	5	6	7
y	14,537	15,605	16,552	17,229	18,340	19,307	20,106	21,183

Solution

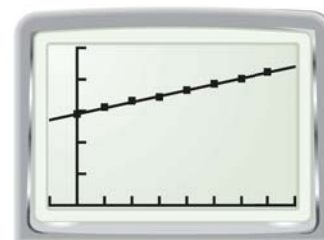
STEP 1 **Make** a scatter plot. The points lie approximately on a line. This suggests a linear model.



STEP 2 **Use** the linear regression feature to find an equation of the model.



STEP 3 **Graph** the model along with the data to verify that the model fits the data well.



▶ A model for the data is $y = 933x + 14,600$.