

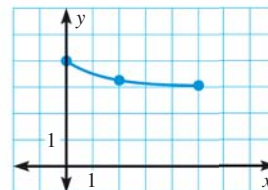
## PROBLEM SOLVING

### EXAMPLES 1 and 3

on pp. 309–310  
for Exs. 46–47

46. **ANTENNA DISH** Three points on the parabola formed by the cross section of an antenna dish are  $(0, 4)$ ,  $(2, 3.25)$ , and  $(5, 3.0625)$ . Write a quadratic function that models the cross section.

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47. **FOOTBALL** Two points on the parabolic path of a kicked football are  $(0, 0)$  and the vertex  $(20, 15)$ . Write a quadratic function that models the path.

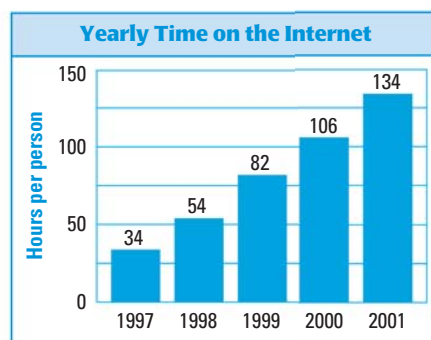
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### EXAMPLE 4

on p. 311  
for Exs. 48–50

48. **MULTI-STEP PROBLEM** The bar graph shows the average number of hours per person per year spent on the Internet in the United States for the years 1997–2001.

- Use a graphing calculator to create a scatter plot.
- Use the quadratic regression feature of the calculator to find the best-fitting quadratic model for the data.
- Use your model from part (b) to predict the average number of hours a person will spend on the Internet in 2010.



49. **RUNNING** The table shows how wind affects a runner's performance in the 200 meter dash. Positive wind speeds correspond to tailwinds, and negative wind speeds correspond to headwinds. The change  $t$  in finishing time is the difference between the runner's time when the wind speed is  $s$  and the runner's time when there is no wind.

Wind speed (m/sec), $s$	-6	-4	-2	0	2	4	6
Change in finishing time (sec), $t$	2.28	1.42	0.67	0	-0.57	-1.05	-1.42



- Use a graphing calculator to find the best-fitting quadratic model.
- Predict the change in finishing time when the wind speed is 10 m/sec.

50. **MULTIPLE REPRESENTATIONS** The table shows the number of U.S. households (in millions) with color televisions from 1970 through 2000.

Years since 1970	0	5	10	15	20	25	30
Households with color TVs (millions)	21	47	63	78	90	94	101

- Drawing a Graph** Make a scatter plot of the data. Draw the parabola that you think best fits the data.
- Writing a Function** Estimate the coordinates of three points on the parabola. Use the points to write a quadratic function for the data.
- Making a Table** Use your function from part (b) to make a table of data for the years listed in the original table above. *Compare* the numbers of households given by your function with the numbers in the original table.