

## Used Car Lab - Chapter 2

In this lab, you will explore the relationship between the advertised resale price of a specific make and model of a car and the car's age. Choose a car make and model (such as Honda Civic). Refer to used-car advertisements in a newspaper, car magazine, or website (such as [www.edmunds.com](http://www.edmunds.com)) to find the ages and prices of about 20 cars of your chosen type. You may use more than one car of a single age, but if you use more than one source of data, be careful that you are not using the *same car* twice.

Let  $p$  be the advertised price (in dollars) of your choice of car that is  $a$  years old. (Note that  $a$  is the age of the car, not the year that it was made.)

### *Analyzing the Data*

1. Include a table of data. State the source(s) of the data.
2. Use a graphing calculator to draw a scattergram of your data. If no line comes close to the data points, choose another make and model of car and start over.
3. Find an equation of a linear model to describe the situation. Write your equation with the function name  $f$ , and round your constants  $m$  and  $b$  to two decimal places if you are using decimal notation (instead of fractions) for them.
4. Use a graphing calculator to draw a graph of your model and the scattergram in the same viewing window. Also, graph the model and scattergram by hand. How well does  $f$  fit the data?
5. Use your model to estimate what the advertised price (to the nearest dollar) should be for your choice of car if it is 10 years old.
6. Use your model to predict at what age (to the nearest year) your car will be worth half as much as the cheapest price listed in your table of data.
7. Find the slope of your model. What does it mean in this situation?
8. Find the  $a$ -intercept and the  $p$ -intercept of your model. What do these intercepts mean in this situation? Do you think that  $f$  models the car situation well near the intercepts? Explain.
9. For what values of  $a$  is there model breakdown for certain? Explain.
10. Sketch a qualitative graph of the relationship between your car's price and its age for all possible ages.
11. Let  $g(a)$  be a down payment (in dollars) of 10% of the resale price for your choice of car that is  $a$  years old. Find an equation for  $g$ .
12. Find  $g(5)$ . What does the result mean in this situation?
13. Compare the slope of the graph of  $g$  to the slope of the graph of  $f$ . Explain why your comparison makes sense in terms of your choice of car.