2 When a group of students in Iowa did the bungee jump experiment, they proposed an algebraic rule relating the length of the stretched bungee cord L (in centimeters) to the attached weight w (in grams). They said that the rule $L = 30 + 0.5w$ could be used to predict the stretched cord length for any reasonable weight.

a. Use the Iowa students' rule to make a table and a graph of sample (w, L) values for $w = 0$ to 120 in steps of 20 grams.

b. How, if at all, do the numbers 30 and 0.5 in the Iowa students' rule relate to the pattern of (w, L) values shown in the table and graph? What do they tell about the way the length of the cord changes as the attached weight changes?

c. Is the pattern of change in the rule-based (w, L) values in Part a different from the pattern of change in your experimental data? If so, what differences in experimental conditions might have caused the differences in results?

Bungee Business Designing the bungee jump apparatus is only part of the task in adding the attraction to Five Star Amusement Park. It is also important to set a *price per jump* that will make the operation profitable. When businesses face decisions like these, they get helpful information from market research. They ask people how much they would be willing to pay for a new product or service.

3 The Five Star marketing staff did a survey of park visitors to find out the *number of customers* that could be expected each day for the bungee jump at various possible *price per jump* values. Their survey produced data that they rounded off and presented in this table.

Market Survey Data

Price per Jump (in dollars)	0	5	10	15	20	25	30
Likely Number of Customers	50	45	40	35	30	25	20

a. Plot the (*price per jump, number of customers*) data on a coordinate graph. Then describe how the predicted *number of customers* changes as *price per jump* increases from \$0 to \$30.

b. The Five Star data processing department proposed the rule $N = 50 - p$ for the relationship between *number of customers* N and *price per jump* p. Does this rule represent the pattern in the market research data? Explain your reasoning.

4 The Five Star staff also wanted to know about *daily income* earned from the bungee jump attraction.

a. If the price per jump is set at \$5, the park can expect 45 bungee jump customers per day. In this case, what is the daily income?

b. Use the market survey data from Problem 3 to estimate the *daily income* earned by the bungee jump for prices from \$0 to \$30 in steps of \$5. Display the (*price per jump, daily income*) data in a table and in a graph. Then describe the pattern relating those variables.

c. What do the results of the Five Star market research survey and the income estimates suggest as the best price to charge for the bungee jump attraction? How is your answer supported by data in the table and the graph of (*price per jump, daily income*) values?