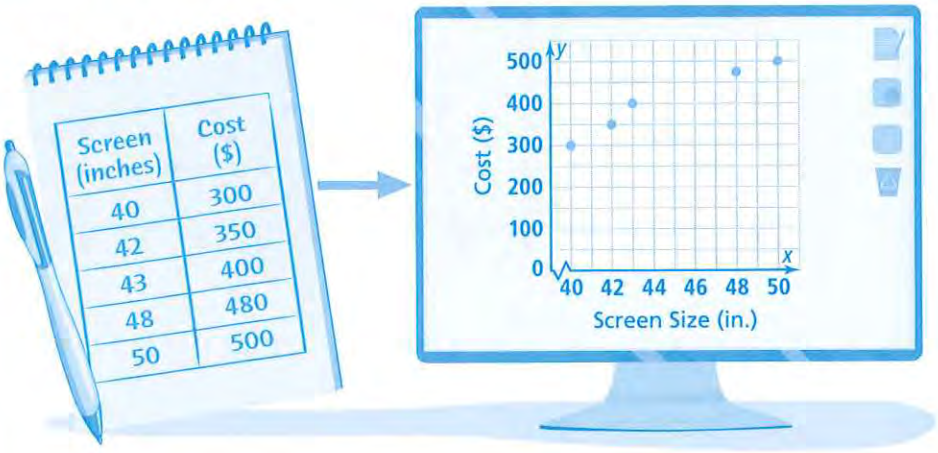
3-5 Scatter Plots and Lines of Fit

MODEL & DISCUSS

Nicholas plotted data points to represent the relationship between screen size and cost of television sets. Everything about the televisions is the same, except for the screen size.



A. Describe any patterns you see.

B. What does this set of points tell you about the relationship of screen size and cost of the television?

C. **Reason** Where do you think the point for a 46-inch television would be on the graph? How about for a 60-inch TV? Explain. MP.2

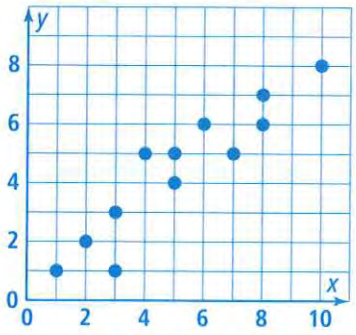
HABITS OF MIND

Use Appropriate Tools How can a table of values help determine whether data can be modeled by a linear function? MP.5

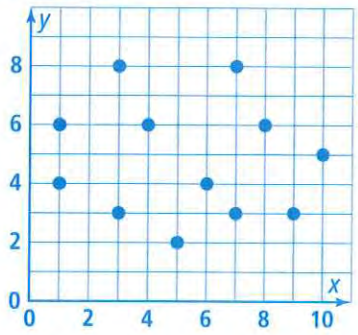
EXAMPLE 1 **Try It! Understand Association**

1. Describe the type of association each scatter plot shows.

a.



b.

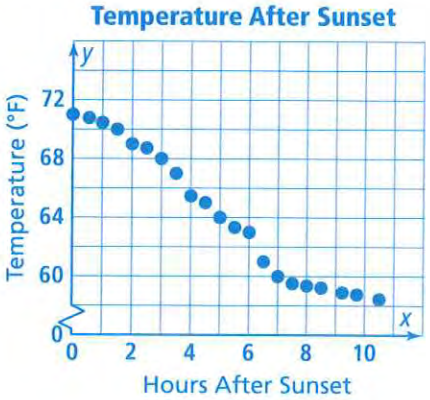


HABITS OF MIND

Reason What features of two data sets can help you determine whether the data sets have a negative, positive, or no association? MP.2

EXAMPLE 2 **Try It! Understand Correlation**

2. How can the relationship between the hours after sunset x and the temperature y be modeled? If the relationship is modeled with a linear function, describe the correlation between the two data sets.



Notes

Assess

EXAMPLE 3 **Try It! Write the Equation of a Trend Line**

3. a. What trend line, in slope-intercept form, models the data from the Example 2 Try It?

b. Explain why there could be no data points on a trend line, yet the line models the data.

EXAMPLE 4 **Try It! Interpret Trend Lines**

4. What is the x-intercept of the trend line? Is that possible in a real-world situation? Explain.

HABITS OF MIND

Construct Arguments What argument can you construct to defend a prediction based on a trend line? Explain. MP.3

Do You UNDERSTAND?

1. **ESSENTIAL QUESTION** How can you use a scatter plot to describe the relationship between two data sets?

2. **Error Analysis** A student claims that if *y*-values are not increasing as *x*-values increase, then the data must show a negative association. Explain the error the student made. **MP.3**

3. **Vocabulary** In a scatter plot that shows *positive association*, describe how *y*-values change as *x*-values increase

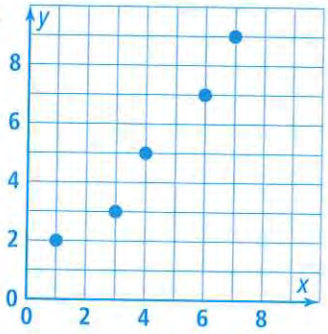
4. **Make Sense and Persevere** Does a trend line need to pass through all the points in a scatter plot? Explain. **MP.1**

5. **Communicate Precisely** Describe how the point-slope formula is useful when writing the equation for a trend line. **MP.6**

Do You KNOW HOW?

Describe the type of association between *x* and *y* for each set of data. Explain.

6.



7.

x	4	6	7	9	10
y	9	7	5	3	3

8. The table shows the hours of studying *x* and a person's test score *y*. What is the equation of a trend line that models the data? What does the slope of your trend line represent?

Hours of Studying	0	1	1	2	3
Test Score	77	80	83	87	92