

Week 1 Friday Course 3 Warm-up

Which of the following has the same value as $\frac{5^{-2}}{5^{-5}}$?

- A) $25^{\frac{2}{5}}$
- B) 5^{-3}
- C) $1^{\frac{2}{5}}$
- D) 5^3

What is the product?

$$(2.5 \times 10^3)(6 \times 10^4)$$

- A) 1.5×10^7
- B) 1.5×10^8
- C) 1.5×10^{12}
- D) 1.5×10^{13}

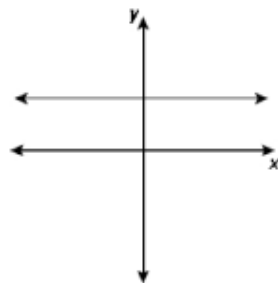
Which of the following is equivalent to the expression below

$$\frac{\sqrt{64}}{\sqrt{16}}$$

- A) 2
- B) $\sqrt{2}$
- C) $\sqrt{5}$
- D) 4



The line graphed below can be described by an equation in the form of $y = mx + b$. For this line, which is true about the values of m and b ?



- A) Both are equal to 0.
- B) Neither is equal to 0.
- C) Only m is equal to 0.
- D) Only b is equal to 0.

Lesson 10.1 Scatter Plots Day 3

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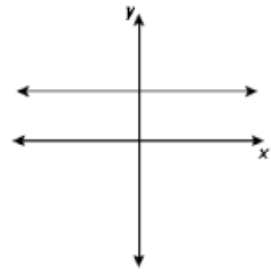
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Lesson 10.1 Scatter Plots Day 3

Objective

TSW

- Construct a scatter plot given two sets of quantitative data.
- Identify patterns of association between two sets of quantitative data.
- Identify outliers in a scatter plot.

Common Core State Standards

8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two variables.

Mathematical Practices 1. Solve problems/persevere. 2. Reason. 4. Model mathematics.



▶ A line of best fit can be used to model the linear association of bivariate quantitative data. A two-way table displays the relative frequencies of categorical data.

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Vocabulary-

What is an outlier?

Lesson 10.1 Scatter Plots Day 3

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TSW

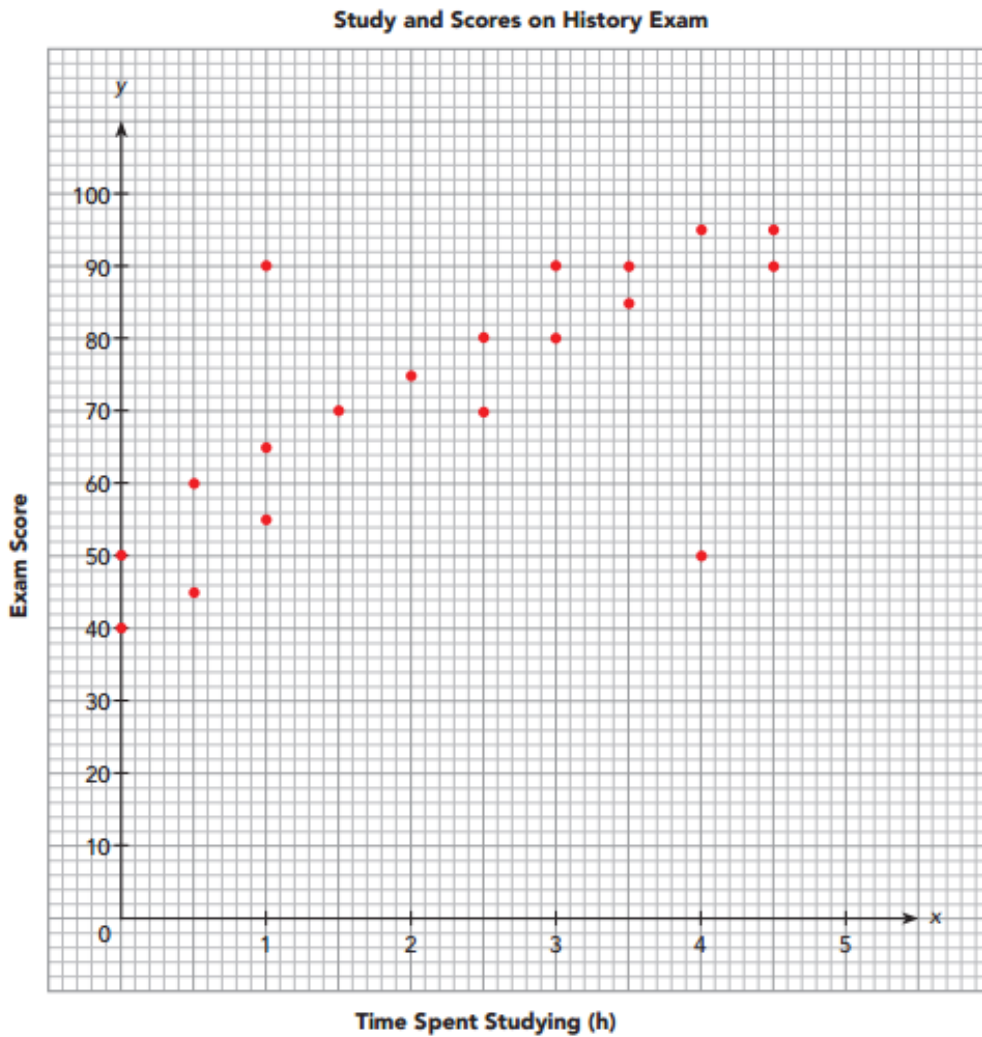
- Construct a scatter plot given two sets of quantitative data.
- Identify patterns of association between two sets of quantitative data.
- Identify outliers in a scatter plot

Vocabulary-

What is an outlier? **Outliers are data points that are very different from the rest of the data points in the data set.**

Example 3 Identify outliers in a scatter plot.

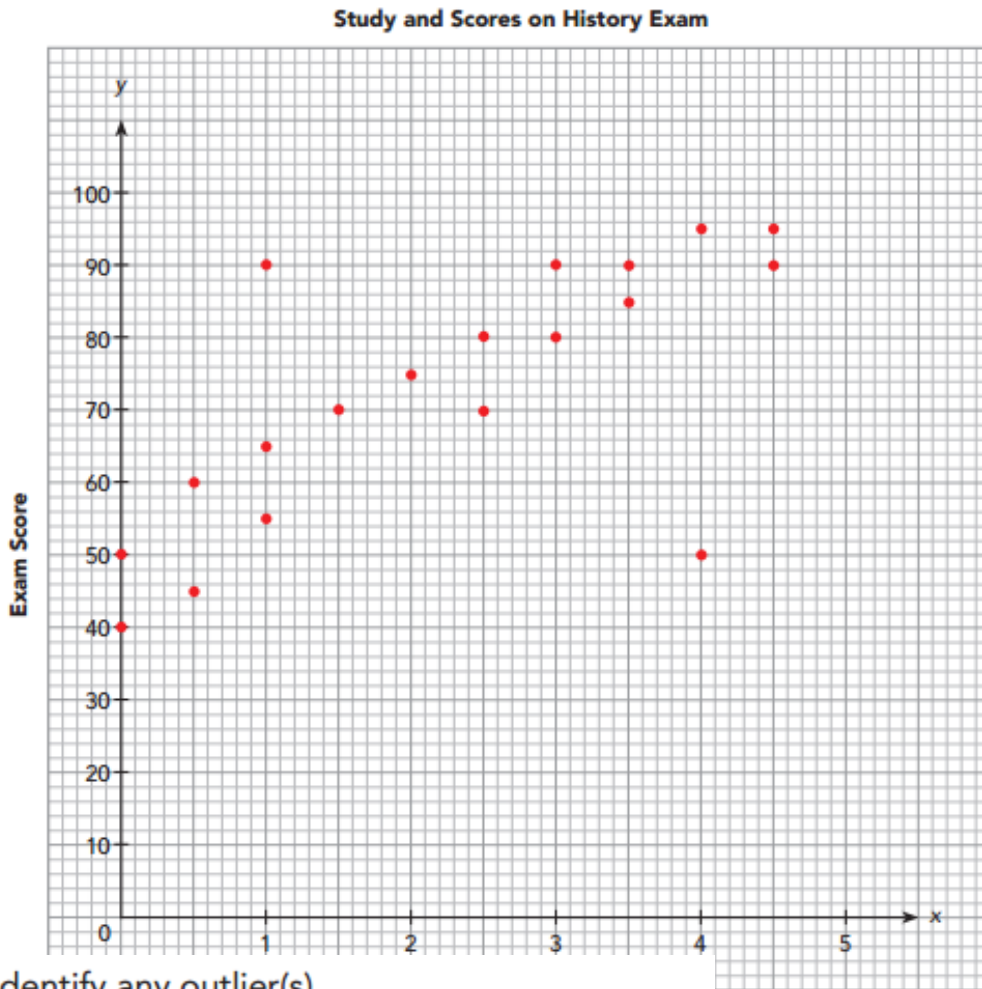
The scatter plot displays bivariate data on the time, x hours, students spent studying for a history exam and the corresponding scores, y , earned on the exam.



- a) Identify any outlier(s).

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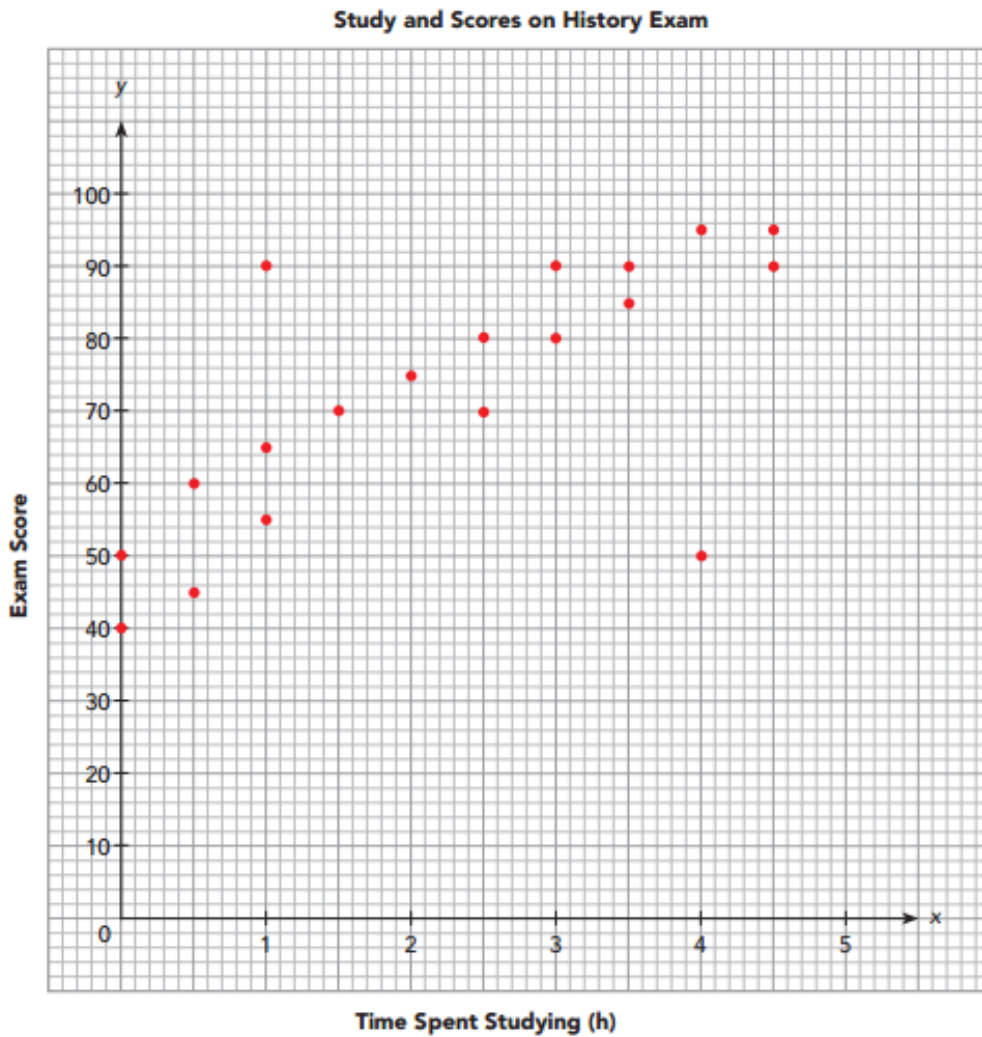
a) Identify any outlier(s).

Solution

Outliers appear to be located at (1, 90) and (4, 50).

Example 3 Identify outliers in a scatter plot.

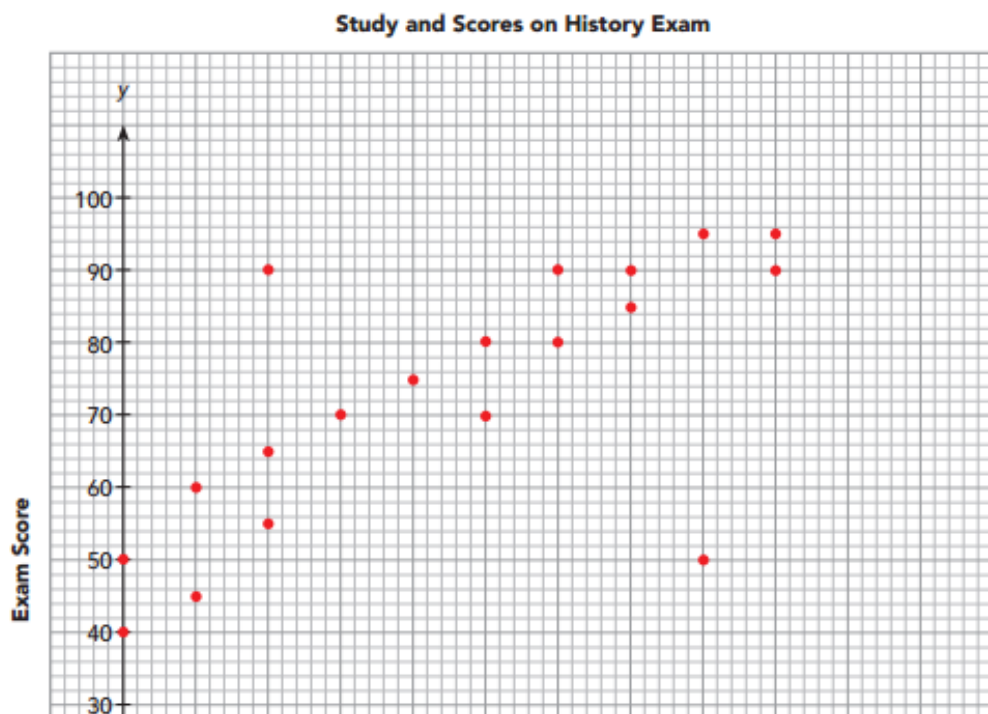
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b) Describe the outlier(s) in this context.

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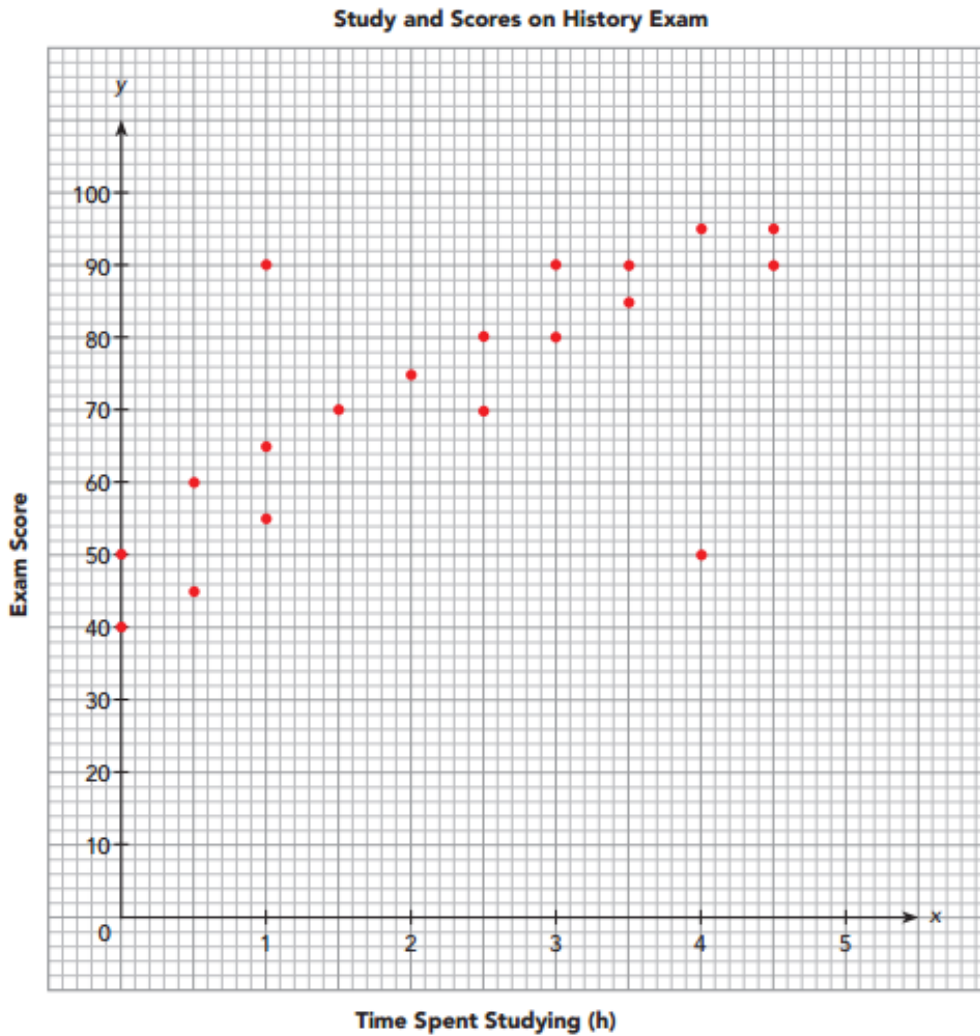
b) Describe the outlier(s) in this context.

Solution

The data point $(1, 90)$ represents a score of 90 earned by a student who studied only 1 hour for the exam. The data point $(4, 50)$ represents a score of 50 earned by a student who studied 4 hours for the exam.

Example 3 Identify outliers in a scatter plot.

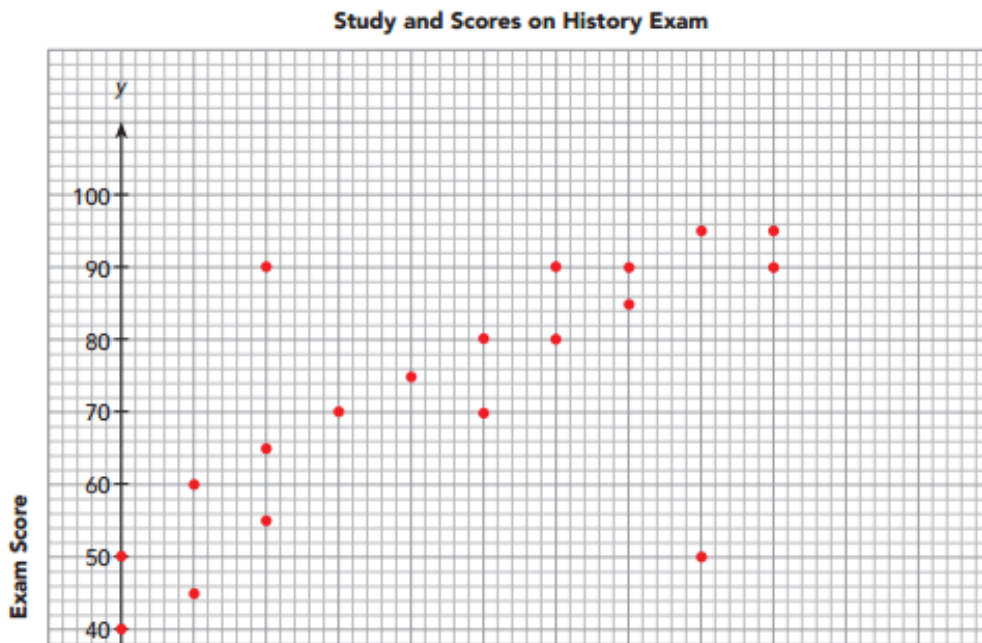
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- c) Describe the meaning of the association between the two variables in this context. _____
Validate the outliers as being very different from the rest of the data points. _____

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- c) Describe the meaning of the association between the two variables in this context. Validate the outliers as being very different from the rest of the data points.

Solution

The strong, positive, and linear association indicates that students who studied more for the history exam earned higher scores. The general trend shows that students who studied only 1 hour earned a score between 50 and 70. However, one student, represented by the outlier, scored a 90 with only 1 hour of study. The general trend shows that students who studied as much as 4 or more hours tended to earn a score of 90 or above. One outlier represents a student's score of 50 after 4 hours of study.

Guided Practice

Use graph paper. Solve.

- 3 Dan is investigating the effect of the amount of water, x , given to tomato seedlings on their growth. He waters each of the 22 plants with a given amount of water daily. He records their height, y , at the end of two weeks. His data are shown below.

Water (fl oz)	4	24	20	12	16	4	20	8	20	28	12
Height (in.)	2.2	11.2	8.8	5.4	8.8	2.4	9.6	3.0	9.2	4.8	6.2

Water (fl oz)	8	4	12	12	28	24	24	8	16	16	28
Height (in.)	4.0	1.6	5.0	4.8	12.4	9.6	10.4	3.2	7.8	8.0	13.2

- a) Construct a scatter plot for these data. Use 1 centimeter on the horizontal axis to represent 4 fluid ounces. Use 1 centimeter on the vertical axis to represent 1 inch. Identify any outlier(s).

An outlier appears to be located at (?, ?).

- b) Describe the outlier(s) in this context.

The outlier represents ? and ? after two weeks.

- c) Describe the meaning of the association between the two variables in this context. Validate the outliers as being very different from the rest of the data points.

The ?, ?, and ? association indicates that tomato seedlings that are given more water daily experience ? growth over the two weeks. The general trend shows that seedlings that are given 28 fluid ounces of water daily generally grew about ? inches, but the outlier represents a seedling that grew only ? inches with ? fluid ounces of water daily.

Guided Practice

Use graph paper. Solve.

- 3 Dan is investigating the effect of the amount of water, x , given to tomato seedlings on their growth. He waters each of the 22 plants with a given amount of water daily. He records their height, y , at the end of two weeks. His data are shown below.

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- a) Construct a scatter plot for these data. Use 1 centimeter on the horizontal axis to represent 4 fluid ounces. Use 1 centimeter on the vertical axis to represent 1 inch. Identify any outlier(s)

An outlier appears to be located at (?, ?). **28; 4.8**

- b) Describe the outlier(s) in this context.

The outlier represents ? and ? after two weeks. **28 fluid ounces of water daily; a height of 4.8 inches**

- c) Describe the meaning of the association between the two variables in this context. Validate the outliers as being very different from the rest of the data points.

The ?, ?, and ? association indicates that tomato seedlings that **strong; positive; linear** are given more water daily experience ? growth over the two weeks. The **more** general trend shows that seedlings that are given 28 fluid ounces of water daily generally grew about ? inches, but the outlier represents a seedling **12 to 13** that grew only ? inches with ? fluid ounces of water daily. **4.8; 28**

Lesson 10.1 Scatter Plots Day 3

Practice 10.1 #8-12 & 14-16

Challenge-

* #13 & 17 provide challenge

*Pick a Problem

*BuzzMath

Name: _____ Date: _____

Practice 10.1

Draw a scatter plot for each table of bivariate data.

1 Use 1 centimeter on the horizontal axis to represent 10 units. Use 1 centimeter on the vertical axis to represent 20 units.

x	10	20	30	70	50	40	50
y	36	60	100	212	156	124	144

x	30	20	30	10	60	60	70
y	96	64	92	40	184	180	216

2 Use 1 centimeter on the horizontal axis to represent 5,000 people. Use 2 centimeters on the vertical axis to represent 5,000 cars.

Population (x in 1,000s)	10	20	20	35	30	10	40
Cars (y in 1,000s)	1	2	3	15	9	2	32

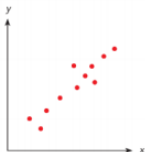
Population (x in 1,000s)	25	15	15	25	40	35	20
Cars (y in 1,000s)	4	1	2	5	30	16	5

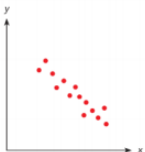
3 Use 1 centimeter on the horizontal axis to represent 1 hour. Use 1 centimeter on the vertical axis to represent a score of 10.

Study Time (x hours)	2	3	5	6	7	4	9
Test Score (y)	22	32	48	62	76	40	90

Study Time (x hours)	8	5	6	4	7	9	3
Test Score (y)	84	52	60	42	72	86	36

Describe the association shown in the bivariate data for each scatter plot.

4 

5 

Course 3



 Lesson Check #8 & 11-can identify and validate the presence of an outlier

Ticket Out the Door- Connect, Extend, Challenge

1. How are the ideas and information presented **CONNECTED** to what you already knew?
2. What new ideas did you get that **EXTENDED** or pushed your thinking in new directions?
3. What is still **CHALLENGING** or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?