



**FSA**  
ELA & Mathematics  
Assessments

**Grade 8**  
**FSA Mathematics**  
**Practice Test Questions**

The purpose of these practice test materials is to orient teachers and students to the types of questions on paper-based FSA Mathematics tests. By using these materials, students will become familiar with the types of items and response formats they may see on a paper-based test. The practice questions and answers are not intended to demonstrate the length of the actual test, nor should student responses be used as an indicator of student performance on the actual test. The practice test is not intended to guide classroom instruction.

**Directions for Answering the  
Mathematics Practice Test Questions**

If you don't know how to work a problem, ask your teacher to explain it to you. Your teacher has the answers to the practice test questions.

You may need conversions to help you solve some of the problems. You may refer to the Reference Sheet on page 5 as often as you like.

Use the space in your Mathematics Practice Test Questions booklet to do your work.

## Directions for Completing the Response Grids

1. Work the problem and find an answer.
2. Write your answer in the answer boxes at the top of the grid.
  - Write your answer with the first digit in the left answer box OR with the last digit in the right answer box.
  - Write only one digit or symbol in each answer box. Do NOT leave a blank answer box in the middle of an answer.
  - Be sure to write a decimal point, negative sign, or fraction bar in the answer box if it is a part of the answer.
3. Fill in a bubble under each box in which you wrote your answer.
  - Fill in one and ONLY one bubble for each answer box. Do NOT fill in a bubble under an unused answer box.
  - Fill in each bubble by making a solid mark that completely fills the circle.
  - You MUST fill in the bubbles accurately to receive credit for your answer.

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4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

} Answer boxes

} Negative sign

} Fraction bar

} Decimal point

} Number bubbles

When a percent is required to answer a question, do NOT convert the percent to its decimal or fractional equivalent. Grid in the percent value without the % symbol. Do the same with dollar amounts.

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4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	●	6	6	6
7	7	7	7	7	●	7
8	8	8	8	8	8	●
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2	●	2	2	2	2	2
3	3	3	●	3	3	3
4	4	4	4	4	4	4
5	●	5	5	5	5	5
6	6	6	6	6	6	6
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4	4	4	4	4	4	4
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6	6	6	6	6	6	●
7	7	7	7	7	7	7
8	8	8	8	8	8	8
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Do NOT write a mixed number, such as  $13\frac{1}{4}$ , in the answer boxes.

Change the mixed number to an equivalent fraction, such as  $\frac{53}{4}$ , or to an

equivalent decimal, such as 13.25. Do not try to fill in  $13\frac{1}{4}$ , as it would be

read as  $\frac{131}{4}$  and would be counted wrong.

**CORRECT**

**INCORRECT**

5	3	/	4			
⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	●	/	/	/	/	/
⊙	⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	●	3	3	3	3	3
4	4	4	●	4	4	4
●	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
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OR

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●	1	1	1	1	1	1
2	2	2	●	2	2	2
3	●	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	●	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
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1	3	1	/	4		
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●	1	●	1	1	1	1
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3	●	3	3	3	3	3
4	4	4	●	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
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8	8	8	8	8	8	8
9	9	9	9	9	9	9

## **Grade 8 FSA Mathematics Reference Sheet**

### **Customary Conversions**

1 foot = 12 inches  
1 yard = 3 feet  
1 mile = 5,280 feet  
1 mile = 1,760 yards

1 cup = 8 fluid ounces  
1 pint = 2 cups  
1 quart = 2 pints  
1 gallon = 4 quarts

1 pound = 16 ounces  
1 ton = 2,000 pounds

### **Metric Conversions**

1 meter = 100 centimeters  
1 meter = 1000 millimeters  
1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams  
1 kilogram = 1000 grams

### **Time Conversions**

1 minute = 60 seconds  
1 hour = 60 minutes  
1 day = 24 hours  
1 year = 365 days  
1 year = 52 weeks

Use the space in this booklet to do your work. For multiple-choice items, fill in one bubble for the correct answer. For matching items and multiselect items, fill in the bubbles for all of the correct answers. For items with response grids, refer to the Directions for Completing the Response Grids on pages 3 and 4. If you change your answer, be sure to erase completely. Calculators are NOT permitted for Session 1 of this practice test.

1. An expression is shown.

$$\frac{(4 \times 10^{-5}) + (2 \times 10^{-5})}{(3 \times 10^7)}$$

Which expression is equivalent?

- Ⓐ  $2 \times 10^{-17}$
  - Ⓑ  $2 \times 10^{-12}$
  - Ⓒ  $2 \times 10^{-2}$
  - Ⓓ  $2 \times 10^{12}$
2. Select all the sequences of transformations that always maintain congruence.
- Ⓐ a reflection and then a translation
  - Ⓑ a translation and then a rotation
  - Ⓒ a rotation and then a reflection
  - Ⓓ a dilation and then a reflection
  - Ⓔ a rotation and then a dilation
  - Ⓕ a translation and then a dilation

3. An equation is shown.

$$3^m \cdot 3^n = 3^{-2}$$

What are possible values for  $m$  and  $n$ ?

$m =$

-	-	-	-	-	-	-	-
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5	5	5	5	5	5	5	5
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7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

$n =$

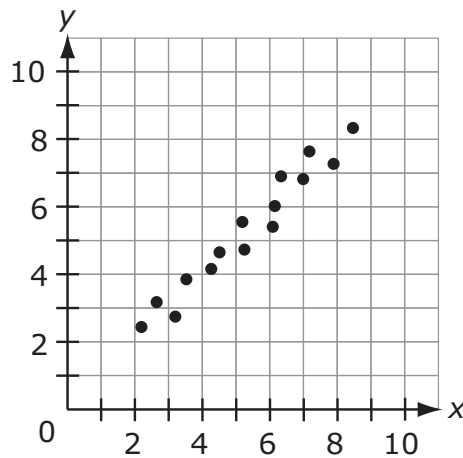
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4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

4. Determine whether each number is rational or irrational.

	Rational	Irrational
$\sqrt{81}$	(A)	(B)
$\sqrt{89}$	(C)	(D)
$\sqrt{121}$	(E)	(F)
$\sqrt{131}$	(G)	(H)

Use the space in this booklet to do your work. For multiple-choice items, fill in one bubble for the correct answer. For matching items and multiselect items, fill in the bubbles for all of the correct answers. For items with response grids, refer to the Directions for Completing the Response Grids on pages 3 and 4. If you change your answer, be sure to erase completely. Scientific calculators may be used for Session 2 of this practice test.

5. A scatter plot is shown.



Which statement is true for the scatter plot?

- Ⓐ The data show no association.
- Ⓑ The data show a positive correlation.
- Ⓒ The data show a negative correlation.
- Ⓓ The data show a nonlinear association.

6. Select the number of solutions for each system of two linear equations.

	Zero Solutions	One Solution	Infinitely Many Solutions
$2x + 2y = 3$ $4x + 4y = 6$	(A)	(B)	(C)
$7x + 5y = 8$ $7x + 7y = 8$	(D)	(E)	(F)
$-2x + 3y = 7$ $2x - 3y = -7$	(G)	(H)	(I)



**7.** Which sequence of transformations results in figures that are similar but not congruent?

- Ⓐ  $90^\circ$  clockwise rotation, translation 5 units to the left
- Ⓑ reflection across the  $x$ -axis, dilation with a factor of  $\frac{1}{2}$
- Ⓒ translation 3 units down, reflection across the  $y$ -axis
- Ⓓ reflection across the  $x$ -axis, translation 7 units to the left

8. The function  $y = 3.50x + 2$  represents the total amount of money,  $y$ , saved over  $x$  weeks.

What is true about the function?

- Ⓐ It is linear because it is always increasing.
- Ⓑ It is linear because it increases at a constant rate.
- Ⓒ It is nonlinear because it is always increasing.
- Ⓓ It is nonlinear because it increases at a constant rate.

9. A cone has a height of 6.4 inches and a diameter of 6 inches.

What is the volume, in cubic inches, of the cone? Use 3.14 for  $\pi$ .

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4	4	4	4	4	4	4	4
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6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

10. Select whether each equation has no solution, one solution, or infinitely many solutions.

	No Solution	One Solution	Infinitely Many Solutions
$3x = 3x + 4$	(A)	(B)	(C)
$3x + 4 = 3x + 4$	(D)	(E)	(F)
$3x + 4 = 4x + 3$	(G)	(H)	(I)

**11.** Select three side lengths, in centimeters (cm), that can form a right triangle.

- Ⓐ 5 cm
- Ⓑ 6 cm
- Ⓒ 8 cm
- Ⓓ 10 cm
- Ⓔ 11 cm
- Ⓕ 12 cm

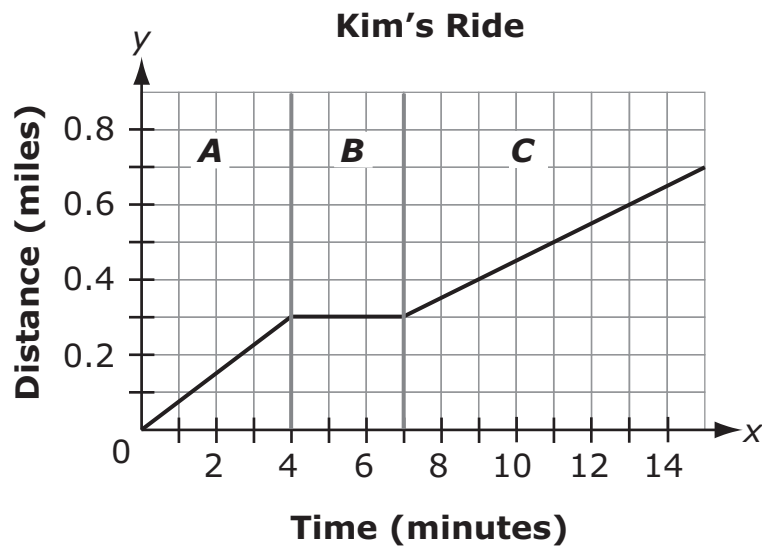
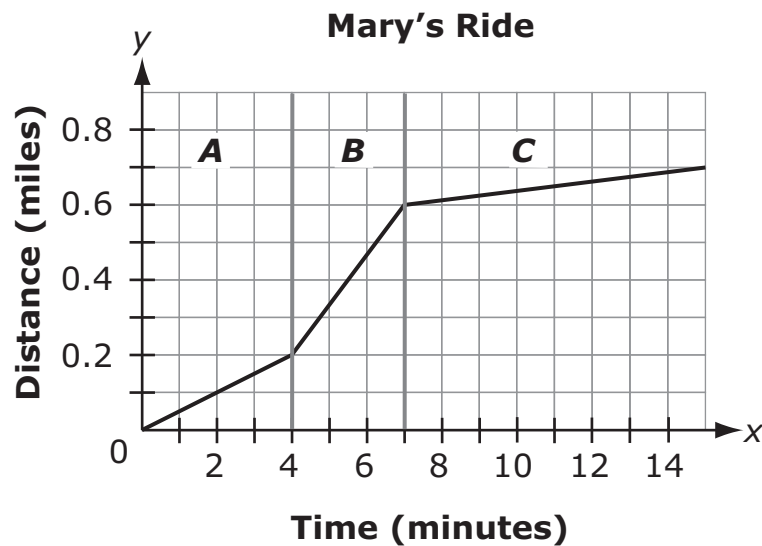
12. Five hundred students were asked whether they prefer apple juice or orange juice. The table shown displays the results.

	Apple Juice	Orange Juice	Total
Boys	30	100	
Girls	210	160	
Total			

How many more girls were surveyed than boys?

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6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
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13. Mary and Kim each take 15 minutes to ride their bikes to school. The graphs of the functions that model their rides are shown, where  $x$  is the time, in minutes, and  $y$  is the distance, in miles.



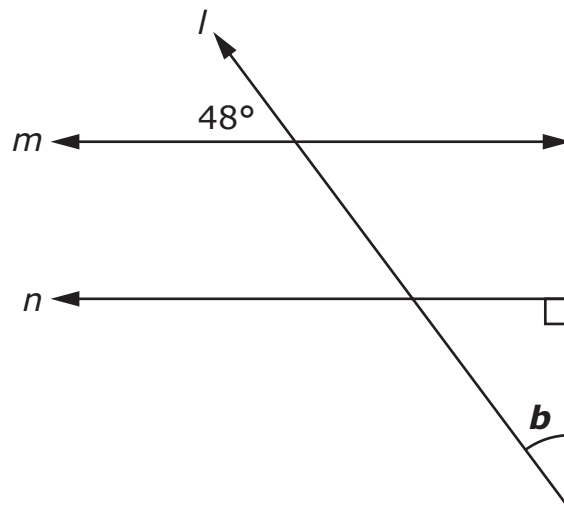
The graphs are divided into time intervals *A*, *B*, and *C*.

Use the graphs to match each statement with the appropriate person or people.

	Mary	Kim
rode her bike fastest in interval <i>A</i> , as compared to the rest of her ride	(A)	(B)
stopped for an interval of time	(C)	(D)
rode slower in interval <i>C</i> than in interval <i>B</i>	(E)	(F)
lives 0.7 miles from school	(G)	(H)



14. A figure with parallel lines  $m$  and  $n$  is shown.

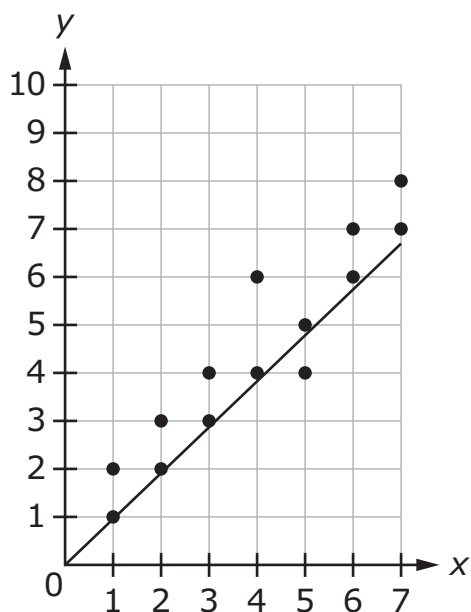


What is the measure, in degrees, of  $\angle b$ ?

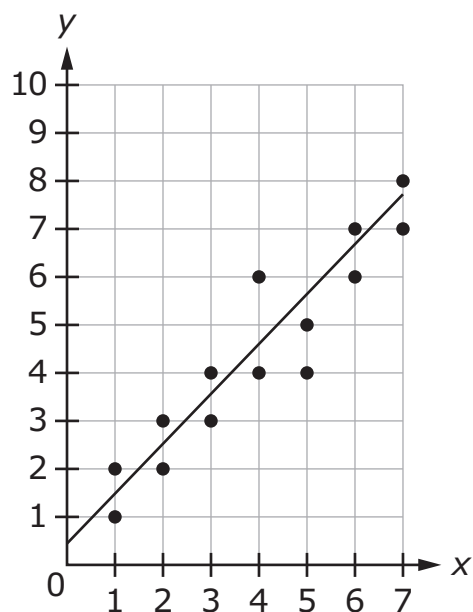
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15. Which graph represents the line of best fit for the scatter plot?

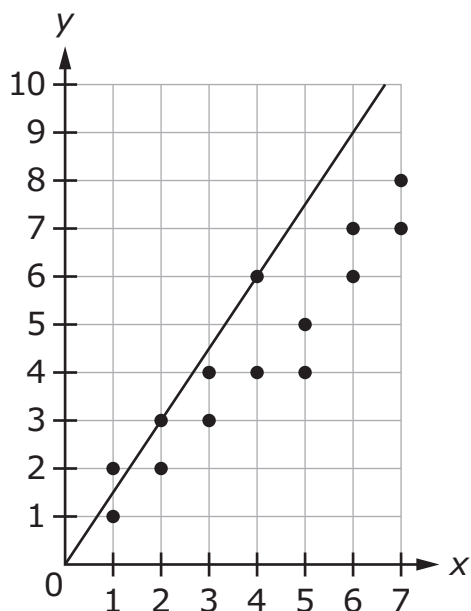
Ⓐ



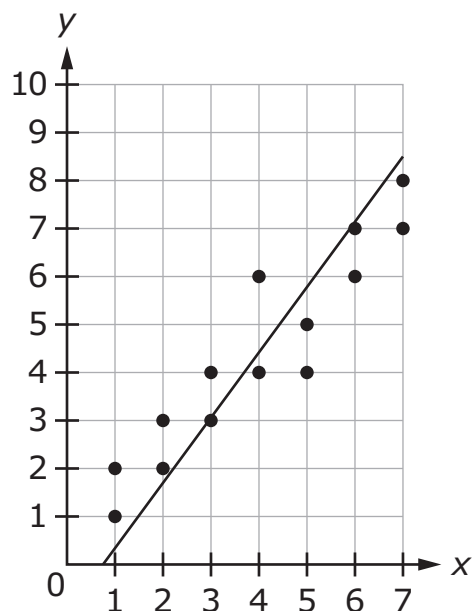
Ⓒ



Ⓑ



Ⓓ



- 16.** A square is cut in half on the diagonal, creating two equal triangles. Each triangle has an area of 0.32 square units.

What is the side length, in units, of the original square?

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1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

17. Kayden creates a linear function where  $x$  is the input,  $y$  is the output, and  $m$  and  $b$  are constants.

A. Which equation could represent Kayden's function?

Ⓐ  $y = \frac{1}{x} + mb$

Ⓑ  $y = mx + b$

Ⓒ  $x = my \cdot by$

B. Which statement about the graph of Kayden's function is true for all values of  $m$  and  $b$ ?

Ⓐ The graph is increasing.

Ⓑ The graph is decreasing.

Ⓒ The graph goes through the origin.

Ⓓ The graph has a constant rate of change.

18. The manager of an ice cream shop is considering which ice cream flavor to offer as the special flavor next month. She asks 175 people whether they like mint or strawberry ice cream.

The two-way table shows the results.

	Like Mint	Do Not Like Mint	Total
Like Strawberry	30	75	105
Do Not Like Strawberry	56	14	70
Total	86	89	175

The manager wants to increase sales, so she is deciding whether to offer mint or strawberry ice cream.

Complete the sentence to support the **best** decision based on the relative frequencies in the table. For each blank, fill in the bubble **before** the word or number that is correct.

The manager should offer \_\_\_\_\_ [ Ⓐ mint Ⓑ strawberry] ice cream because \_\_\_\_\_ [ Ⓐ 65% Ⓑ 40% Ⓒ 49% Ⓓ 32%] of the customers surveyed like mint and \_\_\_\_\_ [ Ⓐ 71% Ⓑ 60% Ⓒ 51% Ⓓ 43%] of the customers like strawberry.



**FSA**  
ELA & Mathematics  
Assessments

**Grade 8**  
FSA Mathematics  
Practice Test Answer Key

The Grade 8 FSA Mathematics Practice Test Answer Key provides the correct response(s) for each item on the practice test. The practice questions and answers are not intended to demonstrate the length of the actual test, nor should student responses be used as an indicator of student performance on the actual test.

1. An expression is shown.

$$\frac{(4 \times 10^{-5}) + (2 \times 10^{-5})}{(3 \times 10^7)}$$

Which expression is equivalent?

- ☐ Ⓐ  $2 \times 10^{-17}$
  - ☒ Ⓑ  $2 \times 10^{-12}$
  - ☐ Ⓒ  $2 \times 10^{-2}$
  - ☐ Ⓓ  $2 \times 10^{12}$
2. Select all the sequences of transformations that always maintain congruence.
- ☒ Ⓐ a reflection and then a translation
  - ☒ Ⓑ a translation and then a rotation
  - ☒ Ⓒ a rotation and then a reflection
  - ☐ Ⓓ a dilation and then a reflection
  - ☐ Ⓔ a rotation and then a dilation
  - ☐ Ⓕ a translation and then a dilation

3. An equation is shown.

$$3^m \cdot 3^n = 3^{-2}$$

What are possible values for  $m$  and  $n$ ?

$m =$

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1	1	1	1	1	1	●
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9	9	9	9	9	9	9

$n =$

					-	3
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1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	●
4	4	4	4	4	4	4
5	5	5	5	5	5	5
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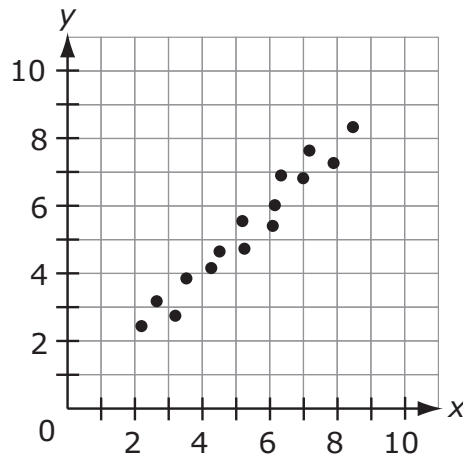
**Other correct responses:** any values for  $m$  and  $n$  such that  $m + n = -2$

4. Determine whether each number is rational or irrational.

	Rational	Irrational
$\sqrt{81}$	●	Ⓐ
$\sqrt{89}$	Ⓒ	●
$\sqrt{121}$	●	Ⓕ
$\sqrt{131}$	Ⓖ	●



5. A scatter plot is shown.



Which statement is true for the scatter plot?

- Ⓐ The data show no association.
- The data show a positive correlation.
- Ⓒ The data show a negative correlation.
- Ⓓ The data show a nonlinear association.

6. Select the number of solutions for each system of two linear equations.

	Zero Solutions	One Solution	Infinitely Many Solutions
$2x + 2y = 3$ $4x + 4y = 6$	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/>
$7x + 5y = 8$ $7x + 7y = 8$	<input type="radio"/> D	<input checked="" type="radio"/>	<input type="radio"/> F
$-2x + 3y = 7$ $2x - 3y = -7$	<input type="radio"/> G	<input type="radio"/> H	<input checked="" type="radio"/>

7. Which sequence of transformations results in figures that are similar but not congruent?

- Ⓐ  $90^\circ$  clockwise rotation, translation 5 units to the left
- reflection across the  $x$ -axis, dilation with a factor of  $\frac{1}{2}$
- Ⓒ translation 3 units down, reflection across the  $y$ -axis
- Ⓓ reflection across the  $x$ -axis, translation 7 units to the left

8. The function  $y = 3.50x + 2$  represents the total amount of money,  $y$ , saved over  $x$  weeks.

What is true about the function?

- ☐ (A) It is linear because it is always increasing.
- ☒ (B) It is linear because it increases at a constant rate.
- ☐ (C) It is nonlinear because it is always increasing.
- ☐ (D) It is nonlinear because it increases at a constant rate.

9. A cone has a height of 6.4 inches and a diameter of 6 inches.

What is the volume, in cubic inches, of the cone? Use 3.14 for  $\pi$ .

	6	0	.	2	8	8
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<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1
<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input checked="" type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2
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<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5
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<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7
<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input checked="" type="radio"/> 8	<input checked="" type="radio"/> 8
<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9

- 10.** Select whether each equation has no solution, one solution, or infinitely many solutions.

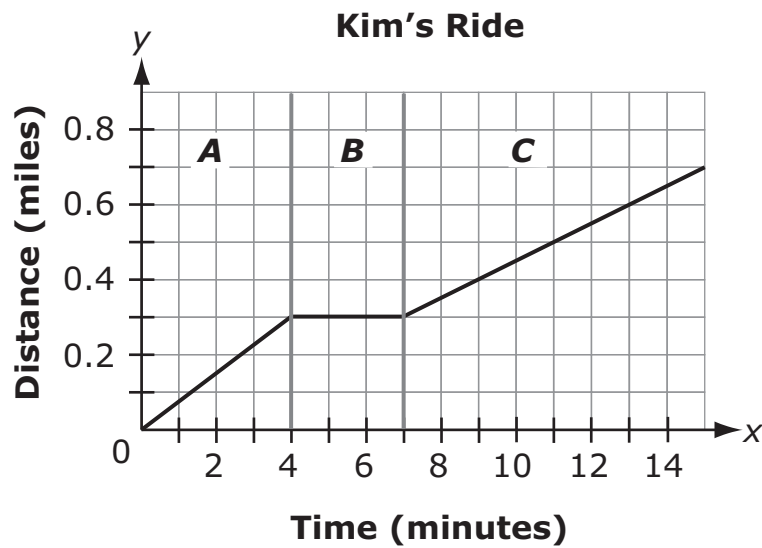
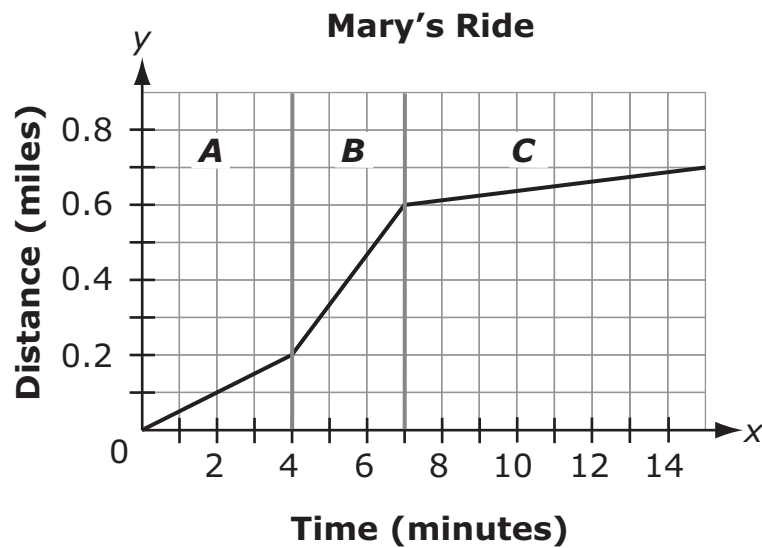
	No Solution	One Solution	Infinitely Many Solutions
$3x = 3x + 4$	<input checked="" type="radio"/>	<input type="radio"/> (B)	<input type="radio"/> (C)
$3x + 4 = 3x + 4$	<input type="radio"/> (D)	<input type="radio"/> (E)	<input checked="" type="radio"/>
$3x + 4 = 4x + 3$	<input type="radio"/> (G)	<input checked="" type="radio"/>	<input type="radio"/> (I)

- 11.** Select three side lengths, in centimeters (cm), that can form a right triangle.

- ☐ (A) 5 cm
- ☒ 6 cm
- ☒ 8 cm
- ☒ 10 cm
- ☐ (E) 11 cm
- ☐ (F) 12 cm



- 13.** Mary and Kim each take 15 minutes to ride their bikes to school. The graphs of the functions that model their rides are shown, where  $x$  is the time, in minutes, and  $y$  is the distance, in miles.



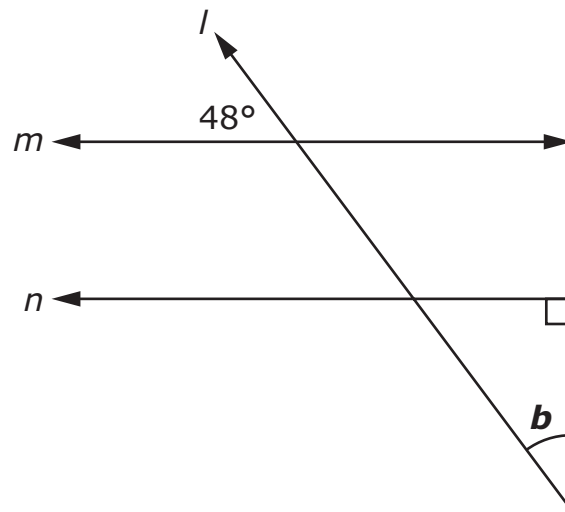
The graphs are divided into time intervals *A*, *B*, and *C*.

Use the graphs to match each statement with the appropriate person or people.

	Mary	Kim
rode her bike fastest in interval <i>A</i> , as compared to the rest of her ride	Ⓐ	●
stopped for an interval of time	Ⓒ	●
rode slower in interval <i>C</i> than in interval <i>B</i>	●	Ⓕ
lives 0.7 miles from school	●	●



14. A figure with parallel lines  $m$  and  $n$  is shown.

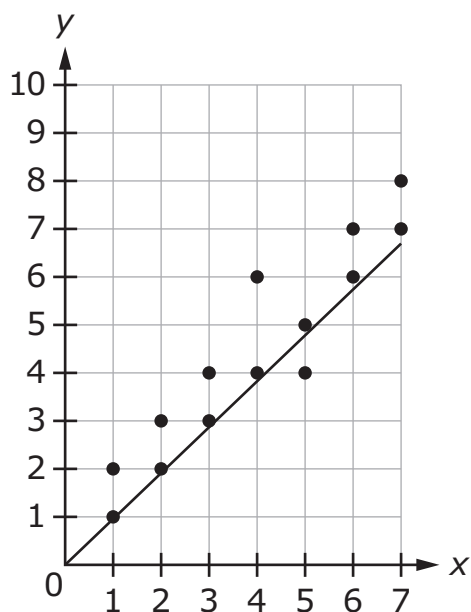


What is the measure, in degrees, of  $\angle b$ ?

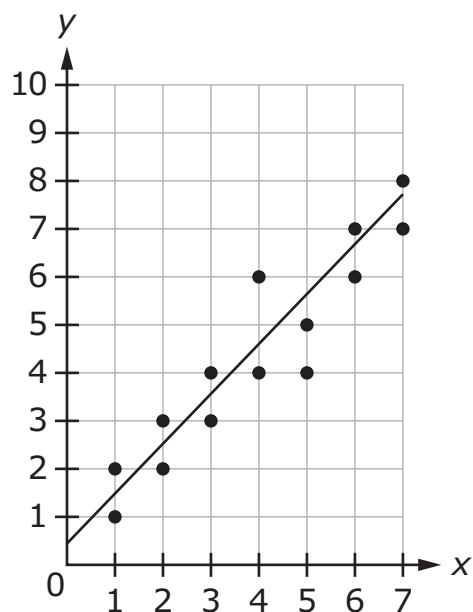
					4	2
-	-	-	-	-	-	-
/	/	/	/	/	/	/
.	.	.	.	.	.	.
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	●
3	3	3	3	3	3	3
4	4	4	4	4	●	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

15. Which graph represents the line of best fit for the scatter plot?

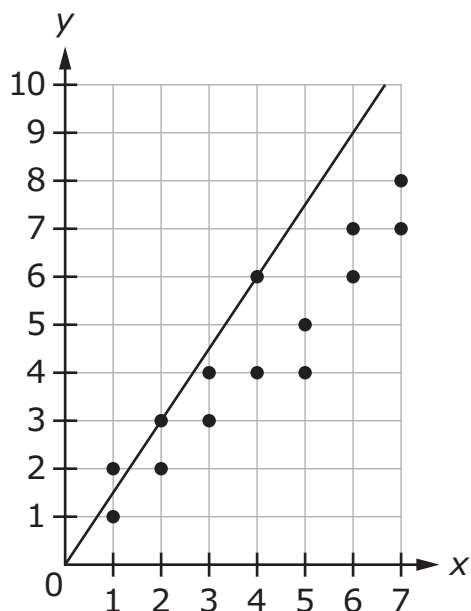
Ⓐ



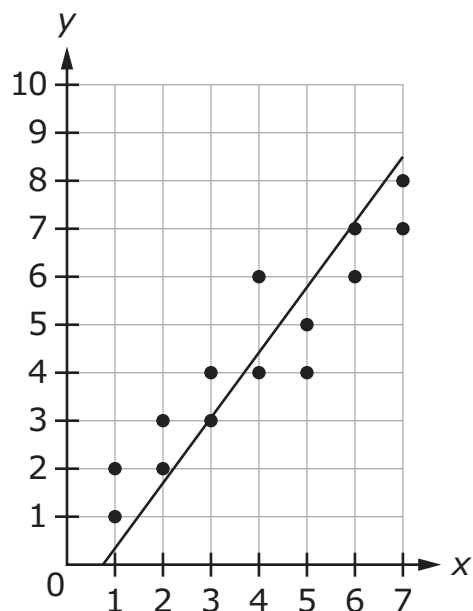
●



Ⓑ



Ⓓ



- 16.** A square is cut in half on the diagonal, creating two equal triangles. Each triangle has an area of 0.32 square units.

What is the side length, in units, of the original square?

				0	.	8
-	-	-	-	-	-	-
/	/	/	/	/	/	
.	.	.	.	.	.	.
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

**17.** Kayden creates a linear function where  $x$  is the input,  $y$  is the output, and  $m$  and  $b$  are constants.

A. Which equation could represent Kayden's function?

☐ (A)  $y = \frac{1}{x} + mb$

☒ (B)  $y = mx + b$

☐ (C)  $x = my \cdot by$

B. Which statement about the graph of Kayden's function is true for all values of  $m$  and  $b$ ?

☐ (A) The graph is increasing.

☐ (B) The graph is decreasing.

☐ (C) The graph goes through the origin.

☒ (D) The graph has a constant rate of change.

- 18.** The manager of an ice cream shop is considering which ice cream flavor to offer as the special flavor next month. She asks 175 people whether they like mint or strawberry ice cream.

The two-way table shows the results.

	Like Mint	Do Not Like Mint	Total
Like Strawberry	30	75	105
Do Not Like Strawberry	56	14	70
Total	86	89	175

The manager wants to increase sales, so she is deciding whether to offer mint or strawberry ice cream.

Complete the sentence to support the **best** decision based on the relative frequencies in the table. For each blank, fill in the bubble **before** the word or number that is correct.

The manager should offer \_\_\_\_\_ [ ☐ A mint ☒ B strawberry ] ice cream because \_\_\_\_\_ [ ☐ A 65% ☐ B 40% ☒ C 49% ☐ D 32% ] of the customers surveyed like mint and \_\_\_\_\_ [ ☐ A 71% ☒ B 60% ☐ C 51% ☐ D 43% ] of the customers like strawberry.