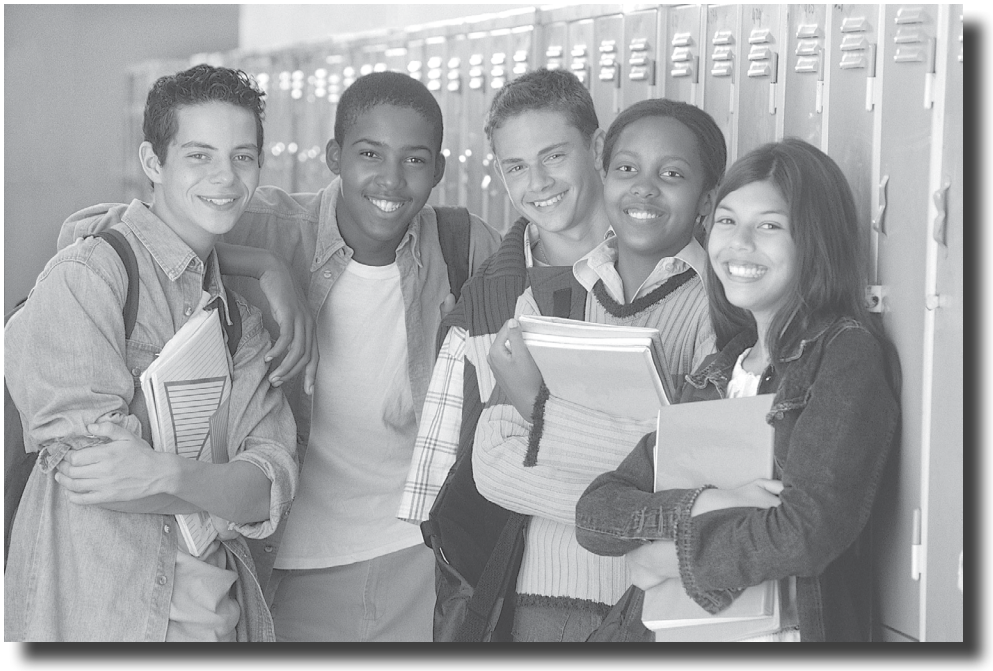
pennsylvania
DEPARTMENT OF EDUCATION

The Pennsylvania System of School Assessment

Mathematics
Item and Scoring Sampler



2018–2019
Grade 8

Pennsylvania Department of Education Bureau of Curriculum, Assessment and Instruction—September 2018

Mathematics Test Directions

On the following pages are the mathematics questions.

- You may not use a calculator for question 1. You may use a calculator for all other questions on this test.

Directions for Multiple-Choice Questions:

Some questions will ask you to select an answer from among four choices.

For the multiple-choice questions:

- First solve the problem on scratch paper.
- Choose the correct answer and record your choice in the answer booklet.
- If none of the choices matches your answer, go back and check your work for possible errors.
- Only one of the answers provided is the correct response.

Directions for Open-Ended Questions:

Some questions will require you to write your response.

For the open-ended questions:

- These questions have more than one part. Be sure to read the directions carefully.
- You cannot receive the highest score for an open-ended question without completing all tasks in the question. For example, if the question asks you to show your work or explain your reasoning, be sure to show your work or explain your reasoning in the space provided.
- If the question does **not** ask you to show your work or explain your reasoning, you may use the space provided, but only those parts of your response that the question specifically asks for will be scored.
- Write your response in the appropriate location within the response box in the answer booklet. Some answers may require graphing, plotting, labeling, drawing, or shading. If you use scratch paper, be sure to transfer your final response and any needed work or reasoning to the answer booklet.

General Description of Scoring Guidelines for Mathematics Open-Ended Questions

4— The response demonstrates a *thorough* understanding of the mathematical concepts and procedures required by the task.

The response provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor "blemish" or omission in work or explanation that does not detract from demonstrating a *thorough* understanding.

3— The response demonstrates a *general* understanding of the mathematical concepts and procedures required by the task.

The response and explanation (as required by the task) are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a *general* understanding.

2— The response demonstrates a *partial* understanding of the mathematical concepts and procedures required by the task.

The response is somewhat correct with *partial* understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

1— The response demonstrates a *minimal* understanding of the mathematical concepts and procedures required by the task.

0— The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures required by the task for that grade level.

Special Categories within zero reported separately:

Blank.....Blank, entirely erased, entirely crossed out, or consists entirely of whitespace

Refusal.....Refusal to respond to the task

Off Task.....Makes no reference to the item but is not an intentional refusal

Foreign Language.....Written entirely in a language other than English

Illegible .....Illegible or incoherent

Grade 8 Formula Sheet

Formulas that you may need on this test are found below.
You may refer back to this page at any time during the mathematics test.
You may use calculator π or the number 3.14 as an approximation of π.

2018
Grade 8

Exponential Properties

$$a^m \cdot a^n = a^{m+n}$$

$$(a^m)^n = a^{m \cdot n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

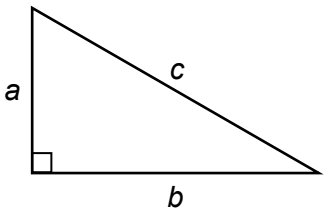
$$a^{-1} = \frac{1}{a}$$

Algebraic Equations

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

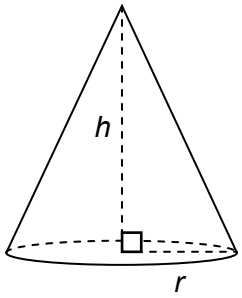
Slope-Intercept Form: $y = mx + b$

Pythagorean Theorem



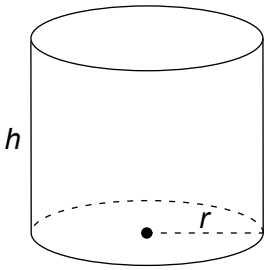
$$a^2 + b^2 = c^2$$

Cone



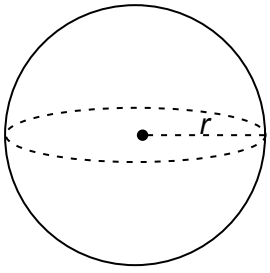
$$V = \frac{1}{3}\pi r^2 h$$

Cylinder



$$V = \pi r^2 h$$

Sphere



$$V = \frac{4}{3}\pi r^3$$

Question 1 in this sampler is to be solved without the use of a calculator.

MULTIPLE-CHOICE ITEMS

1. Which number is the **closest approximation** of $\sqrt{39}$?

A. 6.2

B. 6.5

C. 7.5

D. 7.7

Item Information	
Alignment	A-N.1.1.3
Answer Key	A
Depth of Knowledge	1
p-value A	50% (correct answer)
p-value B	33%
p-value C	10%
p-value D	7%
Option Annotations	A. correct B. selects a number half way between 6 and 7 C. estimates $\sqrt{39}$ as $\sqrt{36} + \sqrt{3}$, and calculates $\frac{5}{2}$ instead of $\sqrt{3}$ D. estimates $\sqrt{39}$ as $\sqrt{36} + \sqrt{3}$

A calculator is permitted for use in solving questions 2–17 in this sampler.

2. Which number is irrational?

A. $3\sqrt{9}$

B. $9\sqrt{3}$

C. $4\sqrt{9}$

D. $9\sqrt{4}$

Item Information	
Alignment	A-N.1.1.1
Answer Key	B
Depth of Knowledge	1
p-value A	9%
p-value B	77% (correct answer)
p-value C	8%
p-value D	6%
Option Annotations	A. does not recognize value of radical as rational B. correct C. does not recognize value of radical as rational D. does not recognize value of radical as rational

3. Four numbers are shown below.

$$\pi \quad \sqrt{\pi} \quad \sqrt{3} \quad \sqrt{8}$$

What is the order of the four numbers from **least** to **greatest**?

A. $\pi \quad \sqrt{\pi} \quad \sqrt{3} \quad \sqrt{8}$

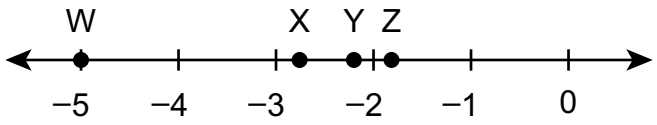
B. $\sqrt{3} \quad \sqrt{\pi} \quad \pi \quad \sqrt{8}$

C. $\sqrt{\pi} \quad \sqrt{3} \quad \pi \quad \sqrt{8}$

D. $\sqrt{3} \quad \sqrt{\pi} \quad \sqrt{8} \quad \pi$

Item Information	
Alignment	A-N.1.1.4
Answer Key	D
Depth of Knowledge	1
p-value A	8%
p-value B	11%
p-value C	8%
p-value D	73% (correct answer)
Option Annotations	A. uses the order given B. bases their choices on the numbers, regardless of the square roots involved C. does square roots by halving the number D. correct

4. Four points are graphed on the number line below.



Which point is located **closest** to the value of $-\sqrt{5}$?

A. point W

B. point X

C. point Y

D. point Z

Item Information	
Alignment	A-N.1.1.5
Answer Key	C
Depth of Knowledge	1
p-value A	10%
p-value B	6%
p-value C	64% (correct answer)
p-value D	20%
Option Annotations	A. does not take the square root of 5 B. uses $-\sqrt{4}$ as $^{-}2$, then since 5 is 1 more than 4 subtracts almost 1 from $^{-}2$ C. correct D. estimates $-\sqrt{5}$ as less than $^{-}2$, but chooses point on the incorrect side of $^{-}2$

5. The average distances between some objects in our solar system are described below.

- The average distance from Earth to the Moon is 3.844×10^5 kilometers (km).
- The average distance from Jupiter to the Sun is approximately 2×10^3 times the average distance from Earth to the Moon.

Based on this information, what is the average distance from Jupiter to the Sun?

A. 7.688×10^2 km

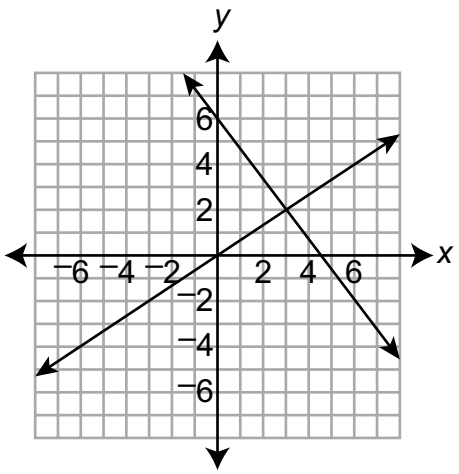
B. 7.688×10^5 km

C. 7.688×10^8 km

D. 7.688×10^{15} km

Item Information	
Alignment	B-E.1.1.4
Answer Key	C
Depth of Knowledge	2
p-value A	10%
p-value B	16%
p-value C	65% (correct answer)
p-value D	9%
Option Annotations	A. subtracts exponents B. forgets $\times 10^3$ C. correct D. multiplies the exponents

6. A system of two linear equations is represented by the graph below.



Which statement about the solution of the system of equations is true?

A. (0, 0) is the only solution.

B. (3, 2) is the only solution.

C. (0, 0) and (3, 2) are both solutions.

D. (0, 0), (0, 6), and (3, 2) are all solutions.

Item Information	
Alignment	B-E.3.1.3
Answer Key	B
Depth of Knowledge	2
p-value A	5%
p-value B	66% (correct answer)
p-value C	15%
p-value D	14%
Option Annotations	A. understands there is just one solution, but thinks it is origin B. correct C. knows point of intersection is solution, but thinks origin is also solution D. knows point of intersection is solution, but thinks *y*-intercepts are also solutions

7. Paul and Jacklyn are on a swim team.

- Paul has completed 140 laps so far this season. He completes an additional 12 laps during each practice.
- Jacklyn has completed 56 laps so far this season. She completes an additional 16 laps during each practice.

Paul and Jacklyn each attend the same number of practices. After how many more practices will Paul and Jacklyn have completed the same number of laps?

A. 3

B. 7

C. 21

D. 49

Item Information	
Alignment	B-E.3.1.5
Answer Key	C
Depth of Knowledge	2
p-value A	9%
p-value B	15%
p-value C	66% (correct answer)
p-value D	10%
Option Annotations	A. uses $140 + 12x$ and $56 + 16x$, but solves as $28x = 84$ B. uses $140 + 12x$ and $56 + 16x$, but solves as $28x = 196$ C. correct D. uses $140 + 12x$ and $56 + 16x$, but solves as $4x = 196$

8. Three functions of x are represented below.

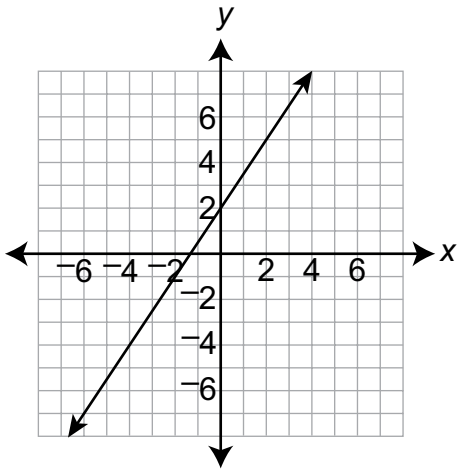
Function 1

$y = \frac{5}{2}x + 3$

Function 2

x	y
0	1
1	$\frac{3}{2}$
2	2
3	$\frac{5}{2}$
4	3

Function 3



For the function with the **greatest** rate of change, what is its value when $x = 10$?

A. 13

B. 17

C. 25

D. 28

Item Information	
Alignment	B-F.1.1
Answer Key	D
Depth of Knowledge	2
p-value A	14%
p-value B	15%
p-value C	18%
p-value D	53% (correct answer)
Option Annotations	A. determines function 1 has greatest rate of change; adds *y*-intercept to 10 B. thinks function 3 has greatest rate of change; evaluates for $x = 10$ C. determines function 1 has greatest rate of change; multiplies that value by 10 D. correct

9. The set of ordered pairs below represents a relation.

{(0, 2), (1, 3), (1, 4), (2, 5), (3, 5)}

Which statement about the relation is true?

A. The relation is a function.

B. The relation is not a function, but removing (1, 3) and replacing it with (2, 6) would make the new relation a function.

C. The relation is not a function, but removing (1, 4) and replacing it with (4, 1) would make the new relation a function.

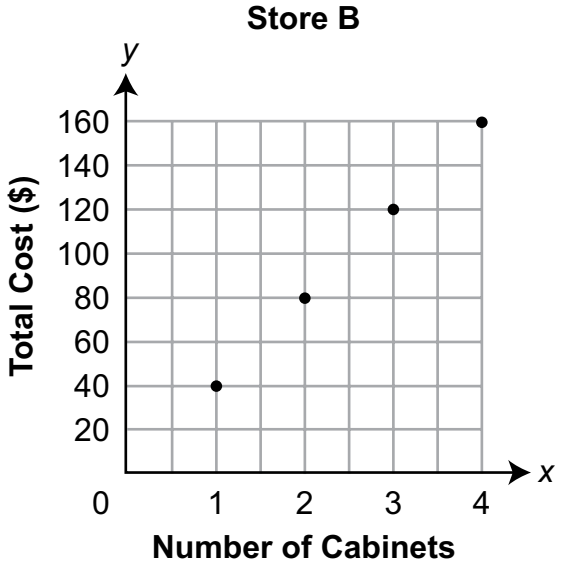
D. The relation is not a function, but removing (3, 5) and replacing it with (3, 6) would make the new relation a function.

Item Information	
Alignment	B-F.1.1.1
Answer Key	C
Depth of Knowledge	2
p-value A	17%
p-value B	9%
p-value C	48% (correct answer)
p-value D	26%
Option Annotations	A. does not see the repeated *x*-value B. notices that 1 is repeated as an *x*-value, but the replacement also results in a repeated *x*-value C. correct D. thinks a repeated *y*-value makes the set of ordered pairs not a function

10. A carpenter is building cabinets. For each cabinet, she needs 8 sets of supplies. At store A, each set of supplies costs $3.75. The total cost ($y$), in dollars, of the supplies she needs to buy at store A to build x cabinets is represented by the equation shown below.

$$y = 8(3.75x)$$

At store B, the total cost (y), in dollars, of the supplies she needs to buy to build x cabinets is represented by the graph shown below.



The carpenter spends a total of $180 on supplies. To which store did the carpenter go for supplies, and how many cabinets can she build?

A. The carpenter went to store A, and she can build 6 cabinets.

B. The carpenter went to store A, and she can build 15 cabinets.

C. The carpenter went to store B, and she can build 5 cabinets.

D. The carpenter went to store B, and she can build 6 cabinets.

Item Information	
Alignment	B-F.1.1.2
Answer Key	A
Depth of Knowledge	2
p-value A	55% (correct answer)
p-value B	12%
p-value C	20%
p-value D	13%
Option Annotations	A. correct B. distributes only to 1.25 C. continued the graph to one more place D. thinks the graph goes over 2 and up 2 more places

11. A linear function of x is graphed on a coordinate grid. The points (6, 34) and (18, 26) lie on the graph of the function. What are the rate of change of the function and the value of the function when $x = 24$?

A. rate of change: $\frac{-3}{2}$
value: $-100\frac{1}{2}$

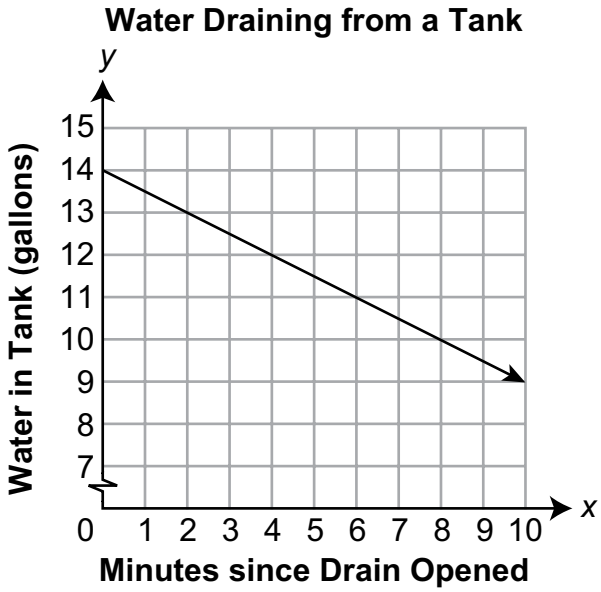
B. rate of change: $\frac{-3}{2}$
value: 7

C. rate of change: $\frac{-2}{3}$
value: $-41\frac{1}{3}$

D. rate of change: $\frac{-2}{3}$
value: 22

Item Information	
Alignment	B-F.2.1.1
Answer Key	D
Depth of Knowledge	2
p-value A	13%
p-value B	24%
p-value C	18%
p-value D	45% (correct answer)
Option Annotations	A. inverts rate of change; $\left(\frac{-3}{2}\right)(24 + 43)$ as value of the function B. inverts rate of change; uses $y = \left(\frac{-3}{2}\right)x + 43$ to model the function C. uses correct rate of change; $\left(\frac{-2}{3}\right)(24 + 38)$ as value of the function D. correct

12. The graph shown below represents the rate at which water drains from a tank once the drain is opened.



Which statement correctly describes the graph?

A. The water is draining at a constant rate of $\frac{1}{2}$ gallon per minute, and the tank contained exactly 14 gallons when the drain was opened.

B. The water is draining at a constant rate of 2 gallons per minute, and the tank contained exactly 14 gallons when the drain was opened.

C. The water is draining at a constant rate of 5 gallons per minute, and the tank contained exactly 14 gallons when the drain was opened.

D. The water is draining at a constant rate of 14 gallons per minute, and the tank contained exactly $\frac{1}{2}$ gallon when the drain was opened.

Item Information	
Alignment	B-F.2.1.2
Answer Key	A
Depth of Knowledge	2
p-value A	78% (correct answer)
p-value B	12%
p-value C	5%
p-value D	5%
Option Annotations	A. correct B. confuses the slope as $^{-}2$ C. confuses where *m* and *b* go and confuses slope D. confuses where *m* and *b* go in an equation

13. Triangle ABC has vertices located at A(1, $^{-}$4), B(4, $^{-}$5), and C(2, $^{-}$1) on a coordinate grid. Triangle ABC undergoes a transformation, resulting in triangle DEF with vertices located at D($^{-}$1, $^{-}$4), E($^{-}$4, $^{-}$5), and F($^{-}$2, $^{-}$1). Which pair of expressions describes a transformation of triangle ABC to triangle DEF and identifies the correct relationship between the two triangles?

A. transformation: reflection across the *y*-axis
relationship: similar and congruent

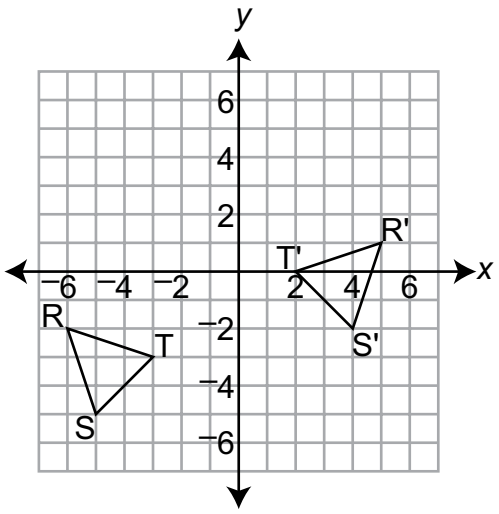
B. transformation: reflection across the *y*-axis
relationship: similar, but not congruent

C. transformation: reflection across the line $y = x$
relationship: similar and congruent

D. transformation: reflection across the line $y = x$
relationship: similar, but not congruent

Item Information	
Alignment	C-G.1.1
Answer Key	A
Depth of Knowledge	2
p-value A	54% (correct answer)
p-value B	20%
p-value C	17%
p-value D	9%
Option Annotations	A. correct B. confuses congruency with similarity C. sees that *x*-coordinate and *y*-coordinate in going from triangle ABC to DEF are "same," so interprets to mean reflection across $y = x$ D. sees that *x*-coordinate and *y*-coordinate in going from triangle ABC to DEF are "same," so interprets to mean reflection across $y = x$; confuses congruency with similarity

14. Triangle RST and triangle R'S'T' are congruent. Both triangles are graphed on the coordinate grid shown below.



Which sequence of transformations could be used to show the congruence between the triangles?

A. a translation 3 units up and then a translation 5 units to the right

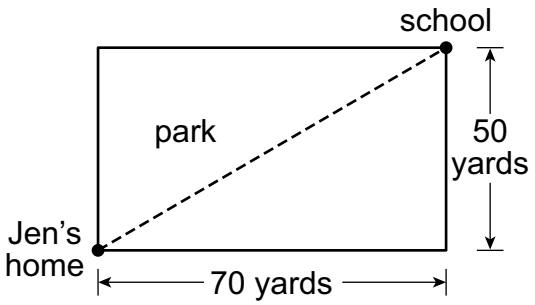
B. a translation 2 units to the right and then a reflection across the *y*-axis

C. a reflection across the *y*-axis and then a translation 1 unit to the right and 3 units up

D. a translation 1 unit to the right and 3 units up and then a reflection across the *y*-axis

Item Information	
Alignment	C-G.1.1.2
Answer Key	D
Depth of Knowledge	2
p-value A	16%
p-value B	11%
p-value C	23%
p-value D	50% (correct answer)
Option Annotations	A. selects translations that only align T and T' B. aligns R with S' C. selects first translation in wrong direction after reflection D. correct

15. Jen walks straight across a rectangular park to school each morning. The dimensions of the park are shown below.



Which measurement is **closest** to the distance Jen walks to school each morning?

A. 86 yards

B. 120 yards

C. 3,500 yards

D. 7,400 yards

Item Information	
Alignment	C-G.2.1.2
Answer Key	A
Depth of Knowledge	1
p-value A	58% (correct answer)
p-value B	21%
p-value C	14%
p-value D	7%
Option Annotations	A. correct B. adds dimensions C. multiplies dimensions D. does not take square root

16. A line segment is graphed on a coordinate grid. The endpoints of the line segment are located at ($^{-}$2, 1) and (10, $^{-}$4). The length, in units, of the line segment is equivalent to the height, in centimeters, of a cone. The radius of the circular base of the cone is 5 centimeters. Which approximation is **closest** to the volume, in cubic centimeters, of the cone?

A. 183

B. 340

C. 497

D. 1,361

Item Information	
Alignment	C-G.3.1.1 C-G.2.1.3
Answer Key	B
Depth of Knowledge	2
p-value A	23%
p-value B	49% (correct answer)
p-value C	21%
p-value D	7%
Option Annotations	A. subtracts lengths of legs instead of using Pythagorean theorem, so determines height to be 7 and uses 5 as radius in volume calculation B. correct C. adds lengths of legs instead of using Pythagorean theorem; uses 19 as height in volume calculation, and uses 5 as radius D. uses Pythagorean theorem correctly and determines height of cone is 13, but uses diameter of 10 in volume calculation

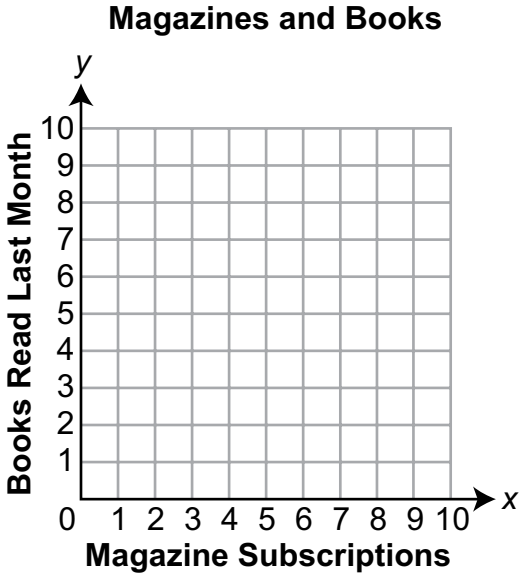
OPEN-ENDED QUESTION

17. Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

A. Construct a scatter plot to represent the data. Draw a line of best fit for the data.



Go to the next page to finish question 17.

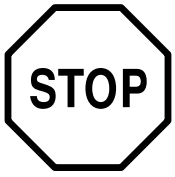
GO ON

17. ***Continued.*** Please refer to the previous page for task explanation.

B. Explain how to determine where to draw the line of best fit for the data.

C. Explain what the slope of the line of best fit represents for this problem. (It is not necessary to find the actual value of the slope.)

After you have checked your work, close your answer booklet and test booklet so your teacher will know you are finished.



Item-Specific Scoring Guideline

#17 Item Information

Alignment	D-S.1	**Depth of Knowledge**	2	**Mean Score**	1.27

Assessment Anchor this item will be reported under:

M08.D-S.1—Investigate patterns of association in bivariate data.

Specific Assessment Anchor Descriptor addressed by this item:

M08.D-S.1.1—Analyze and interpret bivariate data displayed in multiple representations.

Item-Specific Scoring Guideline

Score	In this item, the student . . .
4	Demonstrates a thorough understanding of patterns of association in bivariate data by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of patterns of association in bivariate data by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of patterns of association in bivariate data by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of patterns of association in bivariate data.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

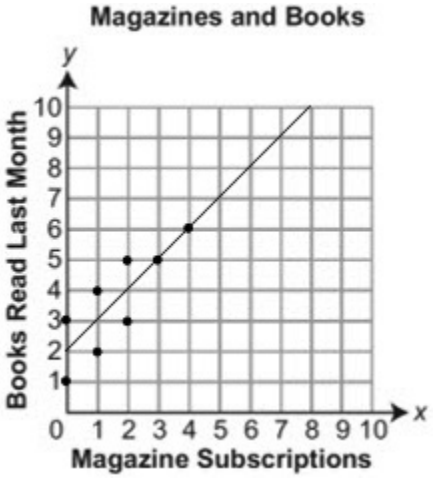
Top-Scoring Student Response and Training Notes

Score	Description
4	Student earns 4 points.
3	Student earns 3.0–3.5 points.
2	Student earns 2.0–2.5 points.
1	Student earns 0.5–1.5 points. OR Student demonstrates minimal understanding of patterns of association in bivariate data.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Top-Scoring Response

Part A (2 points):

1 point for correct scatter plot
1 point for correct line of best fit (based on student's scatter plot)

What?	Why?
	

Part B (1 point):

1 point for complete explanation

OR $\frac{1}{2}$ point for correct but incomplete explanation

What?	Why?
	Sample Explanation: The line of best fit is the same distance from each pair of points with the same *x*-coordinate and passes through the other two points.

Part C (1 point):

1 point for complete explanation

OR $\frac{1}{2}$ point for correct but incomplete explanation

What?	Why?
	Sample Explanation: The slope represents the change in the number of books read compared to the change in the number of magazine subscriptions.

STUDENT RESPONSE

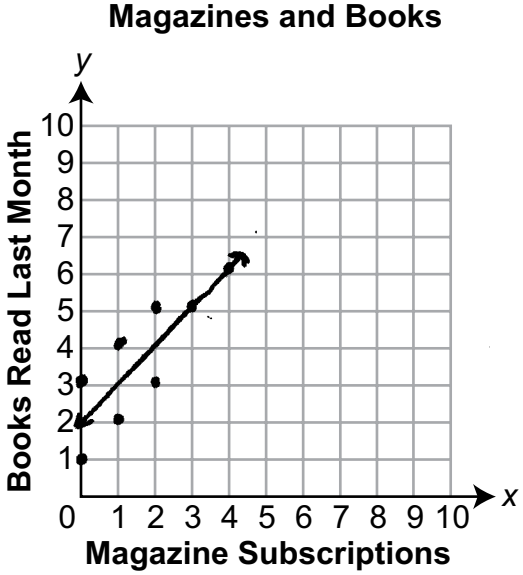
Response Score: 4 points

17. Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

A. Construct a scatter plot to represent the data. Draw a line of best fit for the data.



The response provides a correct scatterplot and a correct line of best fit.

Go to the next page to finish question 17.

GO ON

17. ***Continued.*** Please refer to the previous page for task explanation.

B. Explain how to determine where to draw the line of best fit for the data.

To determine where to draw a line of best fit for the data, observe the data points on the graph. Since the line of best fit must be accurate for all the points, it must generalize the data. The first six values on the chart create a perfect "path" for the best fit line on the path - exactly in the center of two values. The last 2 values are not like the first 6, but they still have an easily identifiable pattern. The line of best fit intersects them. A best fit line can be drawn for any scatterplot when the data values are averaged and generalized.

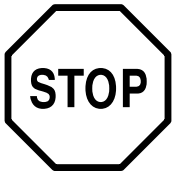
The response provides a complete explanation.

C. Explain what the slope of the line of best fit represents for this problem. (It is not necessary to find the actual value of the slope.)

The slope of a best fit line represents a generalized rate for all of the data points. For example, if the line of best fit had a slope of 1, the number of books read would increase by 1 as the number of magazinesubscriptions went up by 1.

The response provides a complete explanation.

After you have checked your work, close your answer booklet and test booklet so your teacher will know you are finished.



STUDENT RESPONSE

Response Score: 3 points

PART A

Question 17
Page 1 of 2

Line Guide | Item ID | ?

Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

A. Construct a scatter plot to represent the data. Draw a line of best fit for the data.

The response provides a correct scatterplot and a correct line of best fit.

Review/End Test | Pause | Flag | Options | Next

Question 17
Page 2 of 2

Line Guide | Item ID | ?

Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

B. Explain how to determine where to draw the line of best fit for the data.

EQ

In order to draw the line of best fit, you must have a scatter plot with points graphed. Then, you must place teh line not whre it will touch the most points, but where the line is the average over all the points.

213 / 1000

The response provides a complete explanation.

C. Explain what the slope of the line of best fit represents for this problem. (It is not necessary to find the actual value of the slope.)

EQ

The slope of the line represents the average of where teh points are likely to go. If the table were to continue, the line would provide a guid of where the points should go.

174 / 1000

The response provides an incorrect explanation.

Review/End Test | Pause | Flag | Options | Back | Next

STUDENT RESPONSE

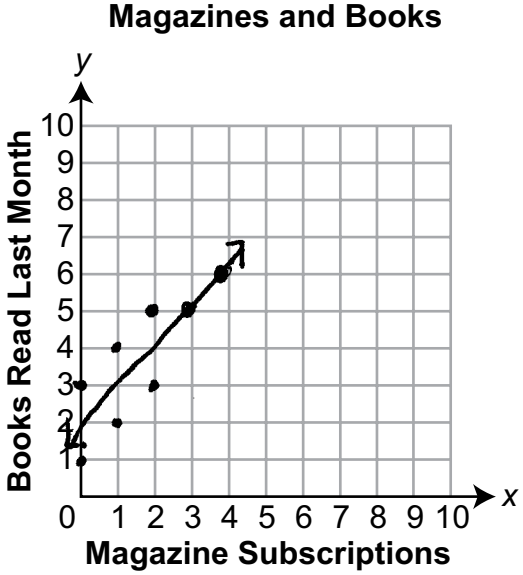
Response Score: 2 points

17. Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

A. Construct a scatter plot to represent the data. Draw a line of best fit for the data.



The response provides a correct scatterplot and a correct line of best fit.

Go to the next page to finish question 17.

GO ON

17. ***Continued.*** Please refer to the previous page for task explanation.

B. Explain how to determine where to draw the line of best fit for the data.

Make sure when you seperate the data that there is a fairly amount of data on the other side.

The response provides an incorrect explanation (explanation is too vague).

C. Explain what the slope of the line of best fit represents for this problem. (It is not necessary to find the actual value of the slope.)

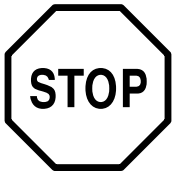
3, 5 4, 6

x1, y2 x2, y2

$$m = \frac{y2 - y1}{x2 - x1} = \frac{6-5}{4-3} = \frac{1}{1} = 1$$

The response provides an incorrect explanation of what the slope represents.

After you have checked your work, close your answer booklet and test booklet so your teacher will know you are finished.



STUDENT RESPONSE

Response Score: 1 point

PART A

Question 17
Page 1 of 2

Line Guide | Item ID | ?

Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

A. Construct a scatter plot to represent the data. Draw a line of best fit for the data.

The response provides a correct scatterplot.
The line of best fit is drawn incorrectly.

Review/End Test | Pause | Flag | Options | Next

Question 17
Page 2 of 2

Line Guide | Item ID | ?

Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

B. Explain how to determine where to draw the line of best fit for the data.

EQ

I drew my line so all the points were cloes to it

49 / 1000

The response provides an incorrect explanation (explanation is too vague).

C. Explain what the slope of the line of best fit represents for this problem. (It is not necessary to find the actual value of the slope.)

EQ

It would be a positive slope

28 / 1000

The response provides an incorrect explanation of what the slope represents.

Review/End Test | Pause | Flag | Options | Back | Next

STUDENT RESPONSE

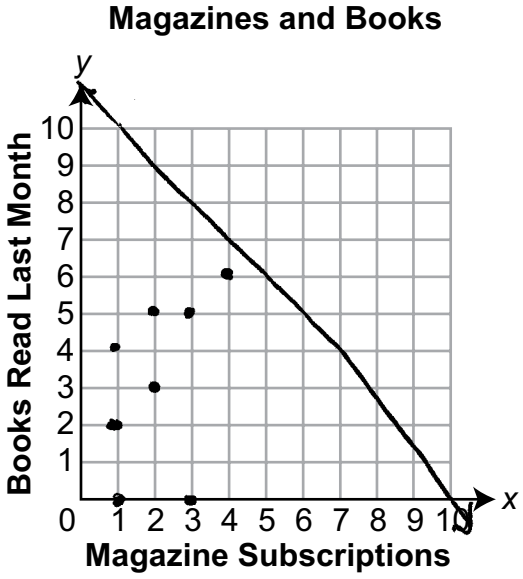
Response Score: 0 points

17. Audrey surveyed eight people about how many magazine subscriptions they have and how many books they read in the last month. The table shows the results of Audrey's survey.

Magazines and Books

Magazine Subscriptions	Books Read Last Month
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

A. Construct a scatter plot to represent the data. Draw a line of best fit for the data.



The response provides an incorrect scatterplot. The line of best fit is drawn incorrectly.

Go to the next page to finish question 17.

GO ON

17. ***Continued.*** Please refer to the previous page for task explanation.

B. Explain how to determine where to draw the line of best fit for the data.

Plot the points on a graph then draw a line.

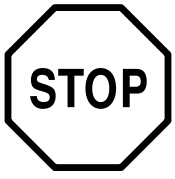
The response provides an incorrect explanation.

C. Explain what the slope of the line of best fit represents for this problem. (It is not necessary to find the actual value of the slope.)

X	Y
0	1
0	3
1	2
1	4
2	3
2	5
3	5
4	6

The response provides an incorrect explanation of what the slope represents.

After you have checked your work, close your answer booklet and test booklet so your teacher will know you are finished.



MATHEMATICS—SUMMARY DATA

MULTIPLE-CHOICE

Sample Number	Alignment	Answer Key	Depth of Knowledge	*p*-values A	*p*-values B	*p*-values C	*p*-values D
1	A-N.1.1.3	A	1	50%	33%	10%	7%
2	A-N.1.1.1	B	1	9%	77%	8%	6%
3	A-N.1.1.4	D	2	8%	11%	8%	73%
4	A-N.1.1.5	C	1	10%	6%	64%	20%
5	B-E.1.1.4	C	2	10%	16%	65%	9%
6	B-E.3.1.3	B	2	5%	66%	15%	14%
7	B-E.3.1.5	C	2	9%	15%	66%	10%
8	B-F.1.1	D	2	14%	15%	18%	53%
9	B-F.1.1.1	C	2	17%	9%	48%	26%
10	B-F.1.1.2	A	2	55%	12%	20%	13%
11	B-F.2.1.1	D	2	13%	24%	18%	45%
12	B-F.2.1.2	A	2	78%	12%	5%	5%
13	C-G.1.1	A	2	54%	20%	17%	9%
14	C-G.1.1.2	D	2	16%	11%	23%	50%
15	C-G.2.1.2	A	1	58%	21%	14%	7%
16	C-G.3.1.1 C-G.2.1.3	B	2	23%	49%	21%	7%

OPEN-ENDED

Sample Number	Alignment	Points	Depth of Knowledge	Mean Score
17	D-S.1	4	2	1.27