Massachusetts MCAS Grade 6 Math Practice

Exam Materials
Pages 2 - 19

Answer Key Materials
Pages 20 - 21

MASSACHUSETTS COMPREHENSIVE ASSESSMENT SYSTEM

PRACTICE TEST

Mathematics

Grade 6

Student Name

School Name

District Name

MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION

Grade 6 Mathematics

SESSION 1

This session contains 8 questions.

You may use your reference sheet during this session.
*You may **not** use a calculator during this session.*

Directions

Read each question carefully and then answer it as well as you can. You must record all answers in this Practice Test Booklet.

For some questions, you will mark your answers by filling in the circles in your Practice Test Booklet. Make sure you darken the circles completely. Do not make any marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

If a question asks you to show or explain your work, you must do so to receive full credit. Write your response in the space provided. Only responses written within the provided space will be scored.

1 A dairy farmer delivered milk over two days.

- On Monday, he used 5 gallons of fuel to drive 40 miles.
- On Tuesday, he drove 120 miles at an average rate of 10 miles per gallon of fuel.

Which of the following sentences about the miles traveled per gallon of fuel on Monday **and** the number of gallons of fuel used on Tuesday is true?

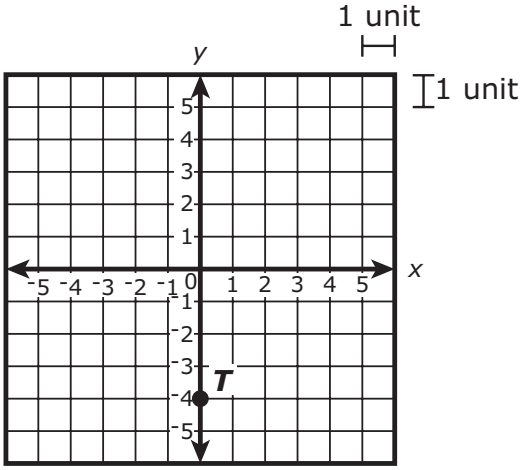
Ⓐ The dairy farmer drove at an average rate of 8 miles per gallon of fuel on Monday, and used a total of 12 gallons of fuel on Tuesday.

Ⓑ The dairy farmer drove at an average rate of 0.125 miles per gallon of fuel on Monday, and used a total of 0.1 gallon of fuel on Tuesday.

Ⓒ The dairy farmer drove at an average rate of 40 miles per gallon of fuel on Monday, and used a total of 120 gallons of fuel on Tuesday.

Ⓓ The dairy farmer drove at an average rate of 5 miles per gallon of fuel on Monday, and used a total of 10 gallons of fuel on Tuesday.

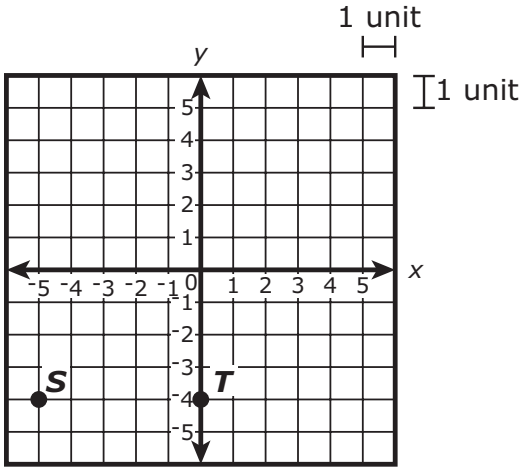
2 The location of point *T* is shown on this coordinate plane.



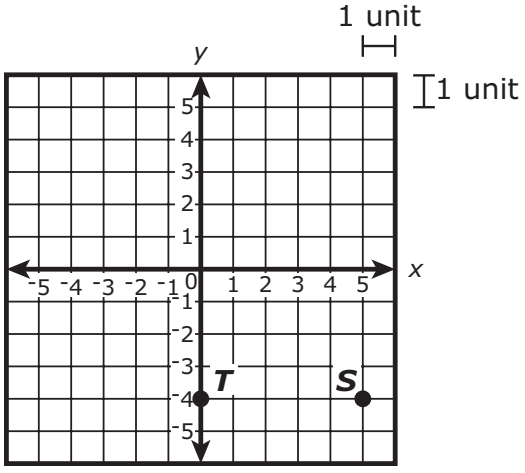
Point *S* is located 5 units to the right of point *T*.

Which of the following graphs shows the location of point *S*?

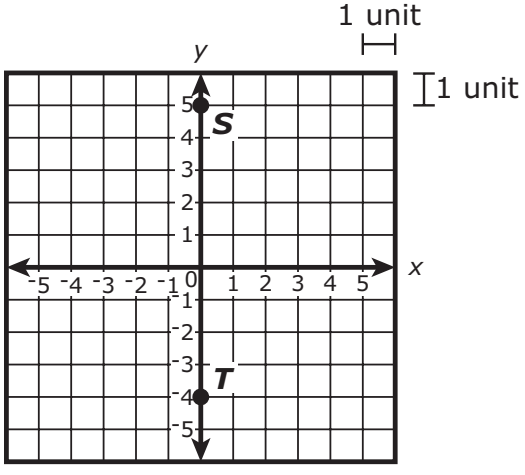
Ⓐ



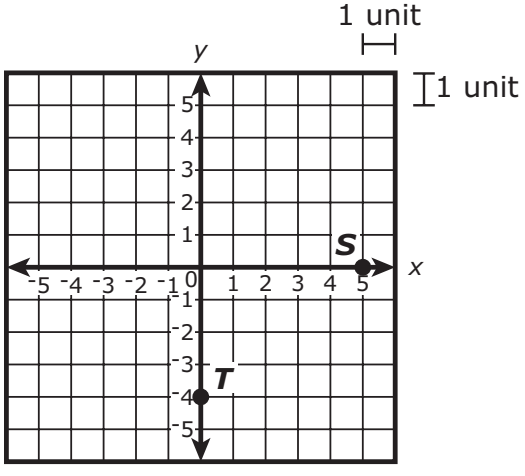
Ⓑ



Ⓒ



Ⓓ

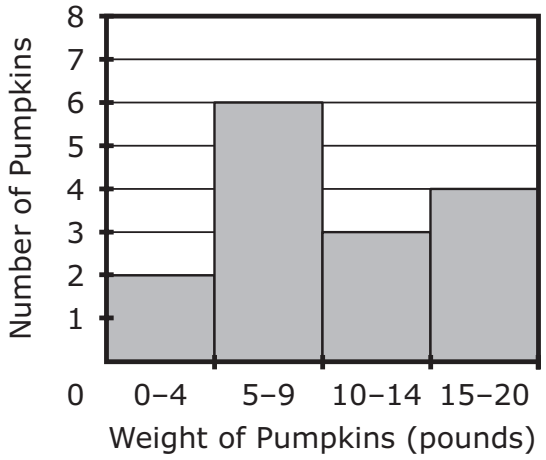


3 This table shows the weight, in pounds, of 15 pumpkins that are for sale at a farm.

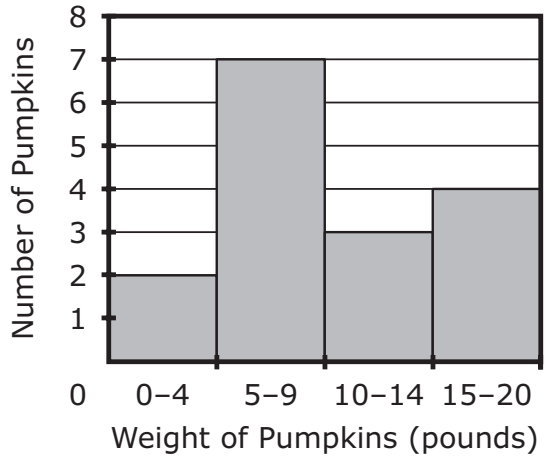
5	18	6	12	10
8	13	7	9	4
16	4	11	7	15

Which of the following histograms correctly represents the data?

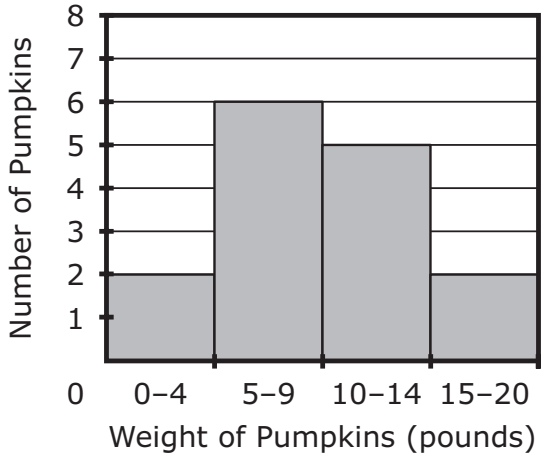
Ⓐ



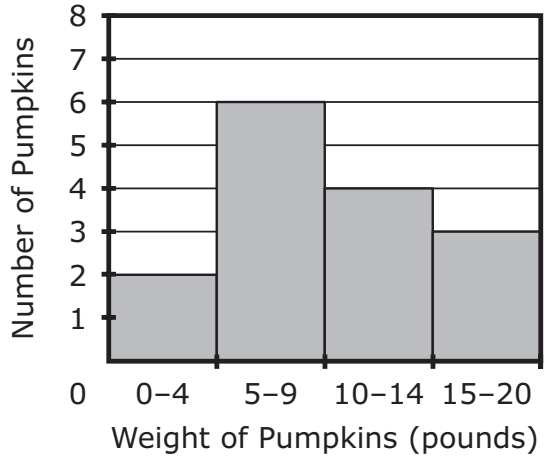
Ⓑ



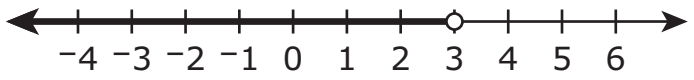
Ⓒ

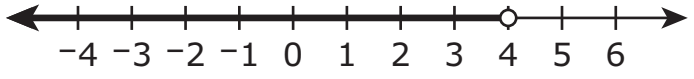


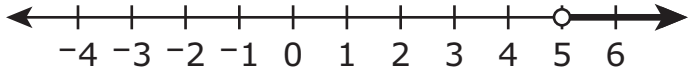
Ⓓ

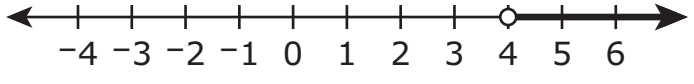


4 Which of the following number lines shows the solution set for $x < 4$?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

5 Which of the following division equations are true?

Select the **two** division equations that are true.

Ⓐ 128 ÷ 16 = 8

Ⓑ 276 ÷ 9 = 35

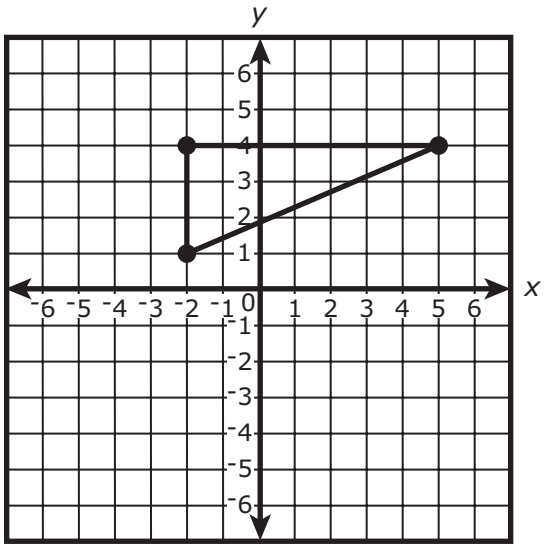
Ⓒ 684 ÷ 6 = 228

Ⓓ 749 ÷ 11 = 43

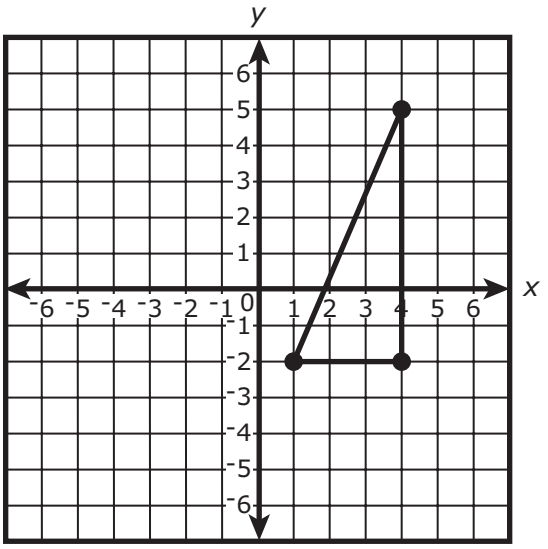
Ⓔ 684 ÷ 3 = 228

6 Which of the following graphs shows a triangle with vertices located at (4, −2), (1, −2), and (4, 5) on the coordinate plane?

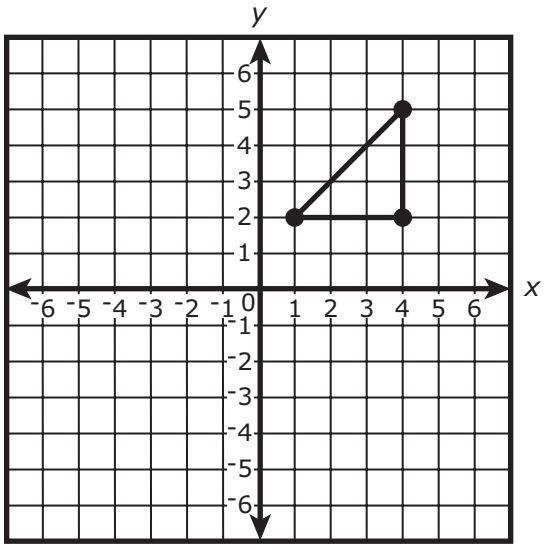
Ⓐ



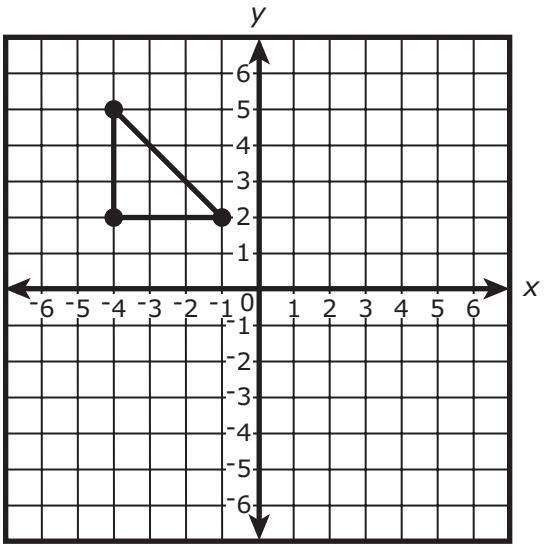
Ⓑ



Ⓒ



Ⓓ

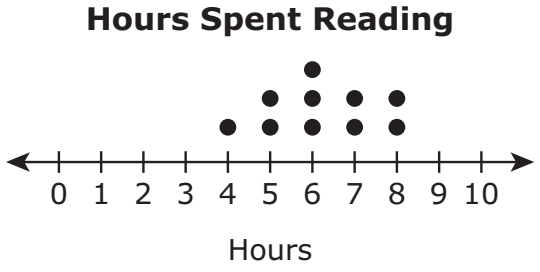


7 A student asks 10 classmates how many hours they each spent reading last week. The student creates this chart to show the responses.

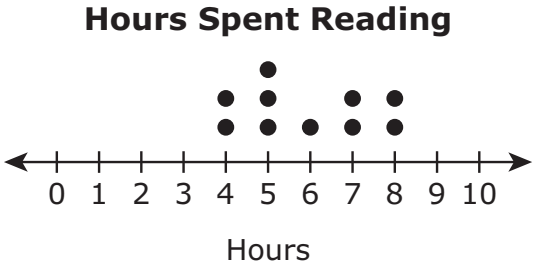
Hours Spent Reading
7, 6, 5, 8, 5, 4, 7, 5, 6, 8

Which dot plot shows the number of hours the classmates spent reading last week?

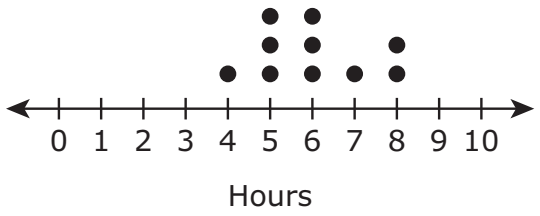
Ⓐ



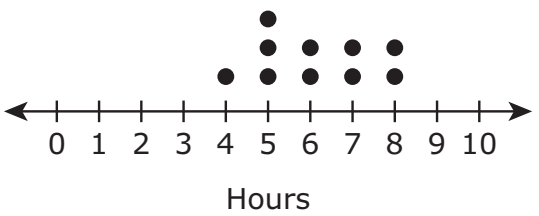
Ⓑ



Ⓒ



Ⓓ



This question has three parts. Be sure to label each part of your response.

8 This table shows the amount, in pounds, of snow that Andy can remove over time using a shovel.

Snow Removal Using a Shovel

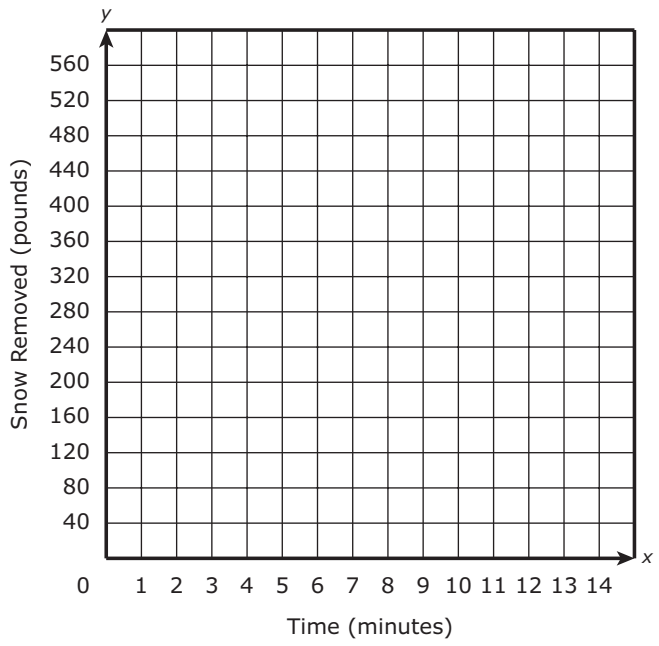
Time (minutes)	1	2	3	4	5	6
Snow Removed (pounds)	80	160	240	320		480

A. Based on the table, what is the amount, in pounds, of snow that Andy can remove in 5 minutes using a shovel? Show or explain how you got your answer.

B. On the coordinate plane provided in your answer space, plot the data from the table to show the amount of snow that Andy can remove over time.

C. Based on your graph in Part B, what is the amount, in pounds, of snow that Andy can remove in 7 minutes? Show or explain how you got your answer.

8


y
560
520
480
440
400
360
320
280
240
200
160
120
80
40
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14
x
Snow Removed (pounds)
Time (minutes)

STOP!

Grade 6 Mathematics
SESSION 2

This session contains 8 questions.

You may use your reference sheet during this session.
*You may **not** use a calculator during this session.*

Directions

Read each question carefully and then answer it as well as you can. You must record all answers in this Practice Test Booklet.

For some questions, you will mark your answers by filling in the circles in your Practice Test Booklet. Make sure you darken the circles completely. Do not make any marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

If a question asks you to show or explain your work, you must do so to receive full credit. Write your response in the space provided. Only responses written within the provided space will be scored.

9 The table shows the colors of 18 cars on the street.

Number of Cars of Each Color

Car Color	Number
Red	6
Blue	4
Black	3
White	5

Based on the information shown in the table, what could the ratio 3:6 describe?

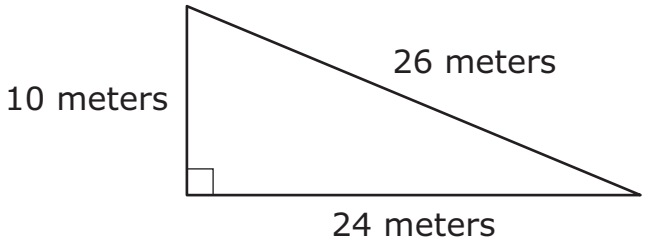
Ⓐ The ratio 3:6 could describe the number of red cars to the number of black cars on the street.

Ⓑ The ratio 3:6 could describe the number of blue cars to the number of white cars on the street.

Ⓒ The ratio 3:6 could describe the number of black cars to the number of red cars on the street.

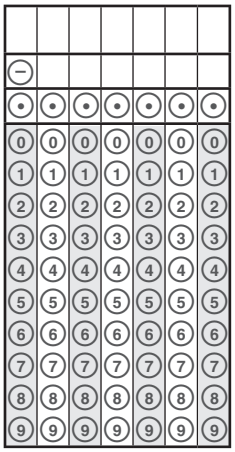
Ⓓ The ratio 3:6 could describe the number of white cars to the number of blue cars on the street.

10 A right triangle and its dimensions are shown in this diagram.



What is the area, in square meters, of the triangle?

Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.



11 A student earns $12 each time he shovels his neighbor's driveway. He earned a total of $108 shoveling the driveway last winter. Which of the following equations could be used to find w, the number of times the student shoveled his neighbor's driveway last winter?

Ⓐ $108w = 12$

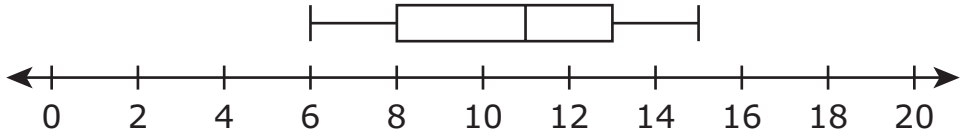
Ⓑ $12w = 108$

Ⓒ $w + 12 = 108$

Ⓓ $108 + w = 12$

12 Luke recorded the number of days it rained each month for 12 months. He made a box plot to represent the data, as shown.

Number of Days of Rain Per Month



What is the interquartile range of the data in Luke's box plot?

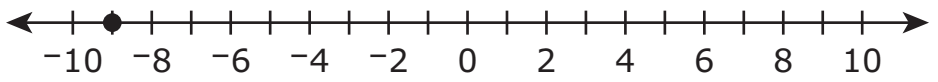
Ⓐ 11

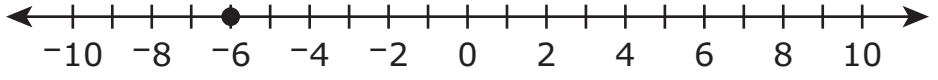
Ⓑ 9

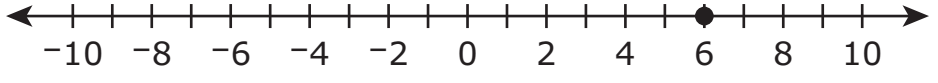
Ⓒ 8

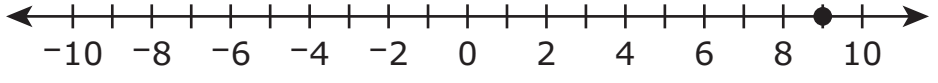
Ⓓ 5

13 Which of the following plotted points represents the location of the number that is the opposite of −9?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

14 Which of the following equations with exponential expressions are true?

Select the **three** correct equations.

Ⓐ $2^3 = 2 \cdot 2 \cdot 2$

Ⓑ $3^2 = 2 \cdot 2$

Ⓒ $4^5 = 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$

Ⓓ $5 \cdot 5 = 2^5$

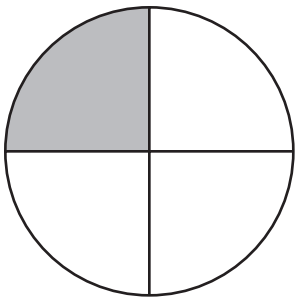
Ⓔ $6 \cdot 6 \cdot 6 = 6^3$

Ⓕ $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 7^1$

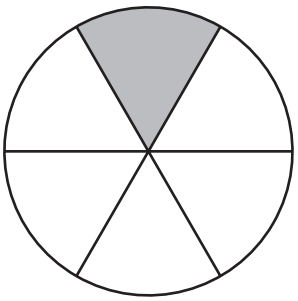
15 A group of 4 students will share $\frac{8}{12}$ of a pizza. Each student will receive the same amount of pizza.

Which of the following models is shaded to represent the fraction of the pizza that each of the 4 students will receive?

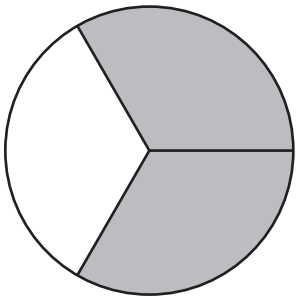
Ⓐ



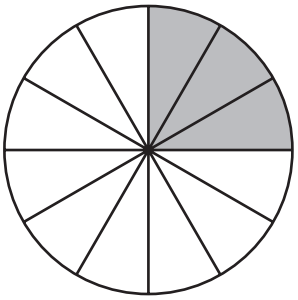
Ⓑ



Ⓒ

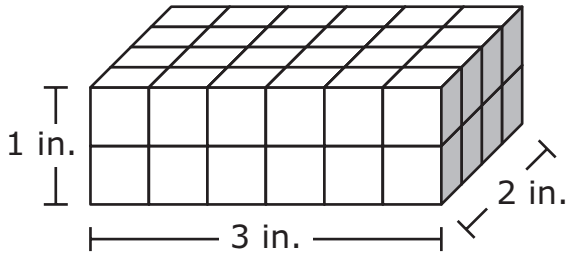


Ⓓ



This question has two parts.

16 A student used congruent cubes to build a right rectangular prism. The prism and its dimensions are shown in this diagram.



Part A

What is the volume, in cubic inches, of the prism?

Ⓐ 6

Ⓑ 12

Ⓒ 36

Ⓓ 48

Part B

What is the volume, in cubic inches, of 1 of the cubes?

Ⓐ 1

Ⓑ $\frac{1}{2}$

Ⓒ $\frac{1}{4}$

Ⓓ $\frac{1}{8}$

STOP!

Grade 6 Mathematics Paper-Based Practice Test Answer Key

The following pages include the answer key for all machine-scored items, followed by rubrics for the hand-scored items. The rubrics also show sample student responses; other valid methods for solving the problem can earn full credit unless a specific method is required by the item. In items where the scores are awarded for full and partial credit, students can still earn points for reasoning or modeling even if they make a computation error.

Session 1

Item Number	Item Type	Answer Key	Number of Points	Standard
1	SR	A	1	6.RP.A.3
2	SR	B	1	6.NS.C.8
3	SR	D	1	6.SP.B.4
4	SR	B	1	6.EE.B.8
5	SR	A, E	1	6.SP.B.4
6	SR	B	1	6.NS.B.2
7	SR	D	1	6.G.A.3
8	CR	*See Rubric*	4	6.RP.A.3

Session 2

Item Number	Item Type	Answer Key	Number of Points	Standard
9	SR	C	1	6.RP.A.1
10	SA	120	1	6.G.A.1
11	SR	B	1	6.EE.B.7
12	SR	D	1	6.SP.B.5
13	SR	D	1	6.NS.C.6
14	SR	A, C, E	1	6.EE.A.1
15	SR	B	1	6.NS.A.1
16	SR	Part A: A Part B: D	2	6.G.A.2

Rubric is on the next page

Scoring Rubric for Grade 6 Practice Test **Session 1 – Question #8**

Scoring Guide	
Score	Description
4	The student response demonstrates an exemplary understanding of the Ratios and Proportional Reasoning concepts involved in using ratio and rate reasoning to solve real-world and mathematical problems. The student computes a missing value using a table, plots the points on a coordinate grid, and uses the graph to determine a different missing value.
3	The student response demonstrates a good understanding of the Ratios and Proportional Reasoning concepts involved in using ratio and rate reasoning to solve real-world and mathematical problems. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result the response merits 3 points.
2	The student response demonstrates a fair understanding of the Ratios and Proportional Reasoning concepts involved in using ratio and rate reasoning to solve real-world and mathematical problems. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the Ratios and Proportional Reasoning concepts involved in using ratio and rate reasoning to solve real-world and mathematical problems.
0	The student response contains insufficient evidence of understanding of the Ratios and Proportional Reasoning concepts involved in using ratio and rate reasoning to solve real-world and mathematical problems to merit any points.

Sample Response:

a. 400 pounds of snow

b. Correctly plots all 6 coordinates from the table completed in part A

c. 560 pounds of snow