# Massachusetts MCAS Grade 5 Math Practice

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MASSACHUSETTS COMPREHENSIVE ASSESSMENT SYSTEM

# PRACTICE TEST

# Mathematics

# Grade 5

Student Name

School Name

District Name

MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION

# Grade 5 Mathematics

## SESSION 1

This session contains 6 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** Which of the following represents this number written in expanded form?

*four hundred sixteen and eighty-two hundredths*

Ⓐ $4 \times 100 + 1 \times 10 + 6 \times 1 + 8 \times \frac{1}{10} + 2 \times \frac{1}{100}$

Ⓑ $4 \times 100 + 1 \times 10 + 6 \times 1 + 80 \times \frac{1}{10} + 2 \times \frac{1}{100}$

Ⓒ $400 \times 100 + 10 \times 10 + 6 \times 1 + 8 \times \frac{1}{10} + 2 \times \frac{1}{100}$

Ⓓ $400 \times 100 + 10 \times 10 + 6 \times 1 + 80 \times \frac{1}{10} + 2 \times \frac{1}{100}$

**2** What is the value of this expression?

$$\frac{3}{10} - \frac{1}{4} + \frac{4}{5}$$

Ⓐ $\frac{9}{10}$

Ⓑ $\frac{6}{11}$

Ⓒ $\frac{6}{20}$

Ⓓ $\frac{17}{20}$

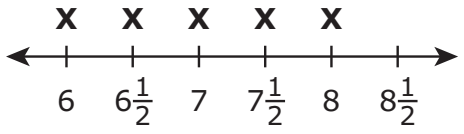
**3** This list shows the shoe sizes of eight students in a fifth-grade class.

**Student's Shoe Sizes**

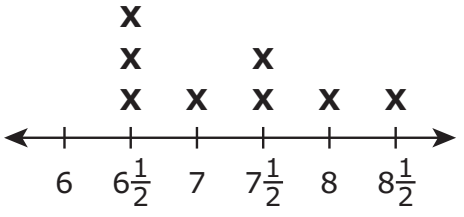
| Name | Shoe Size |
|---|---|
| Becca | 7 |
| Cara | $6\frac{1}{2}$ |
| Dean | $6\frac{1}{2}$ |
| Kareem | $7\frac{1}{2}$ |
| Leah | 6 |
| Luke | 8 |
| Suzanne | $6\frac{1}{2}$ |
| Wally | $7\frac{1}{2}$ |

Which of the following line plots correctly represents the shoe sizes of the students?

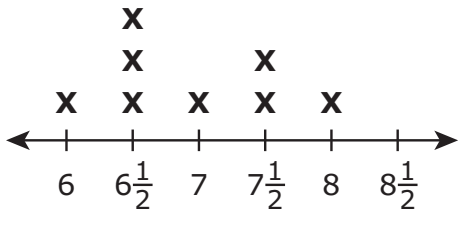
Ⓐ **Student's Shoe Sizes**



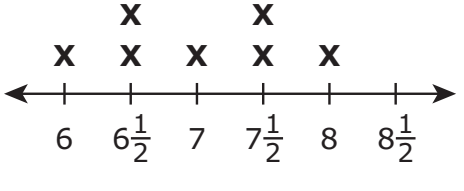

Ⓑ **Student's Shoe Sizes**




Ⓒ **Student's Shoe Sizes**




Ⓓ **Student's Shoe Sizes**

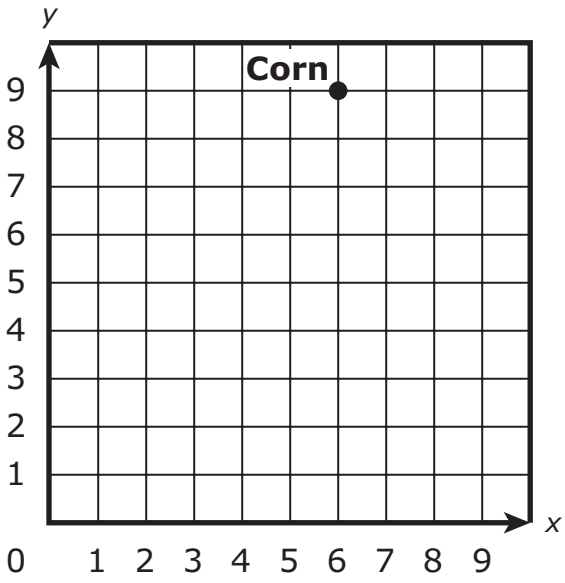


**This question has two parts.**

**4** A gardener planted asparagus, beans, and corn in a garden. The gardener will use a coordinate plane to show where in the garden each crop was planted.

**Part A**

The location of the corn is shown on this coordinate plane.




Which of the following ordered pairs represents the location of the corn?

Ⓐ (9, 5)

Ⓑ (9, 6)

Ⓒ (5, 9)

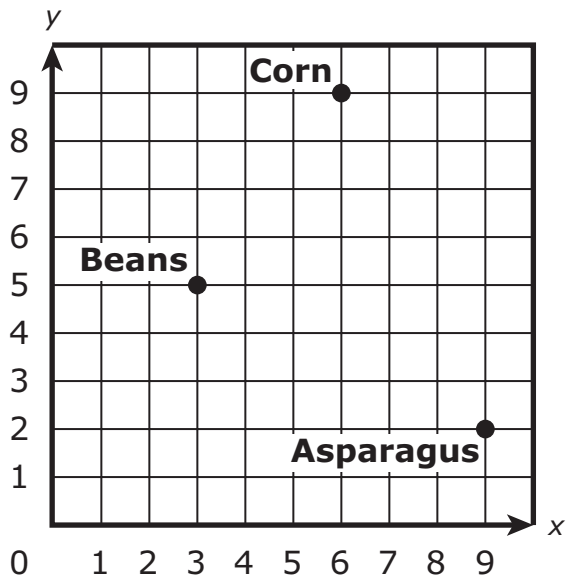
Ⓓ (6, 9)

**Part B**

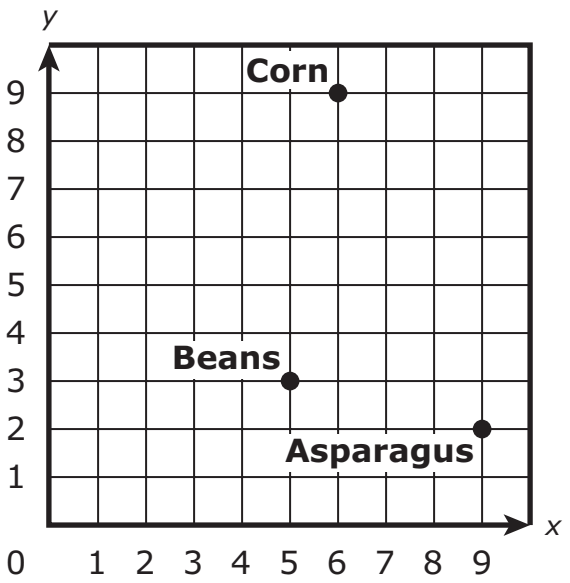
The location of the asparagus is (9, 2). The location of the beans is (3, 5).

Which coordinate plane represents the locations of the asparagus and the beans?

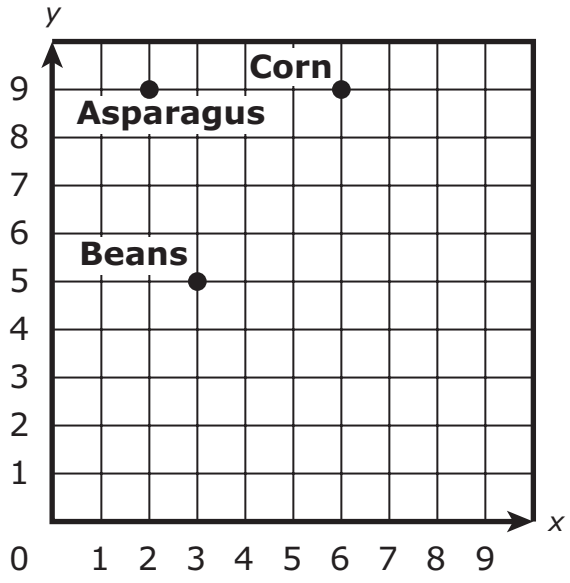
Ⓐ



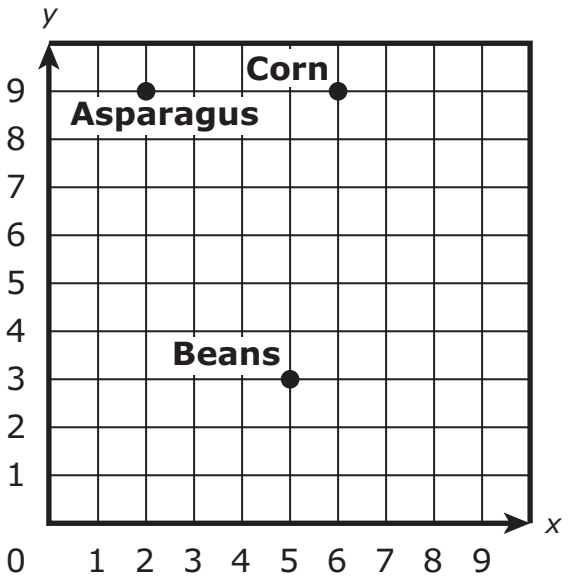

Ⓑ




Ⓒ




Ⓓ



**5** Which of the following expressions have a product that is greater than $\frac{2}{5}$?

Select the **two** correct answers.

Ⓐ $\frac{2}{5} \times \frac{3}{2}$

Ⓑ $\frac{2}{5} \times \frac{1}{3}$

Ⓒ $\frac{2}{5} \times \frac{3}{4}$

Ⓓ $\frac{2}{5} \times \frac{6}{6}$

Ⓔ $\frac{2}{5} \times \frac{4}{1}$

**6** A farmer has 20 bins of apples. Each bin has 25 red apples and 30 green apples.

Which of the following expressions can be used to find the total number of apples in all the bins?

Ⓐ $20 + (25 \times 30)$

Ⓑ $20 \times (25 + 30)$

Ⓒ $(20 + 25) \times (20 + 30)$

Ⓓ $(20 \times 25) \times (20 \times 30)$



STOP!

# Grade 5 Mathematics

## SESSION 2

This session contains 6 questions.

*You may use your reference sheet during this session.*
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### Directions

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**7** Which of the following statements are true?

Select the **three** correct answers.

Ⓐ The product of $6 \times \frac{5}{3}$ will be greater than 6 because the fraction $\frac{5}{3}$ is greater than 1.

Ⓑ The product of $6 \times \frac{5}{3}$ will be less than 6 because the fraction $\frac{5}{3}$ is less than 1.

Ⓒ The product of $7 \times \frac{6}{6}$ will be greater than 7 because the fraction $\frac{6}{6}$ is greater than 1.

Ⓓ The product of $7 \times \frac{6}{6}$ will be equal to 7 because the fraction $\frac{6}{6}$ is equal to 1.

Ⓔ The product of $3 \times \frac{2}{3}$ will be less than 3 because the fraction $\frac{2}{3}$ is less than 1.

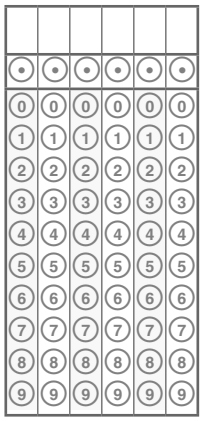
Ⓕ The product of $3 \times \frac{2}{3}$ will be equal to 3 because the fraction $\frac{2}{3}$ is equal to 1.

**8** A package is in the shape of a right rectangular prism.

- The base of the package has an area of 15 square inches.
- The height of the package is 12 inches.

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

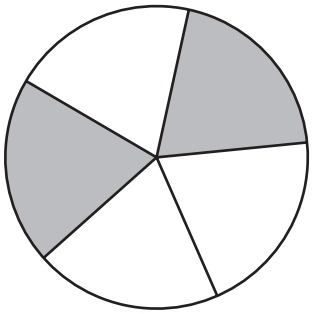
Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.



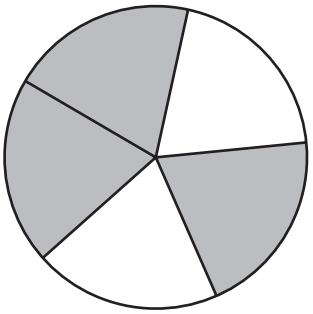
**9** In which of the following models does the shaded part show the product of this expression?

$$\frac{2}{3} \times \frac{1}{2}$$

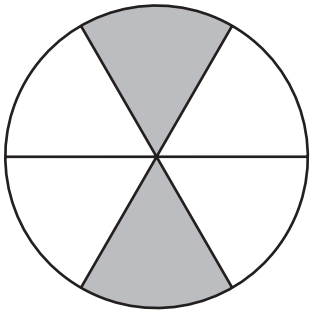
Ⓐ



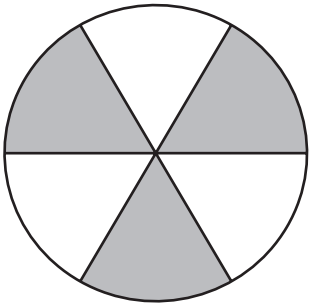
Ⓑ



Ⓒ



Ⓓ



**10** A student wants to round this number.

89.473

Which of these statements about rounding the number are correct?

Select the **three** correct answers.

Ⓐ The number 89.473 rounded to the nearest one is 89.

Ⓑ The number 89.473 rounded to the nearest one is 90.

Ⓒ The number 89.473 rounded to the nearest tenth is 89.47.

Ⓓ The number 89.473 rounded to the nearest tenth is 89.5.

Ⓔ The number 89.473 rounded to the nearest hundredth is 89.46.

Ⓕ The number 89.473 rounded to the nearest hundredth is 89.47.

**11** Which of the following conversions are correct?

Select the **two** correct answers.

Ⓐ 2 g = 2,000 mg

Ⓑ 2 g = 0.02 kg

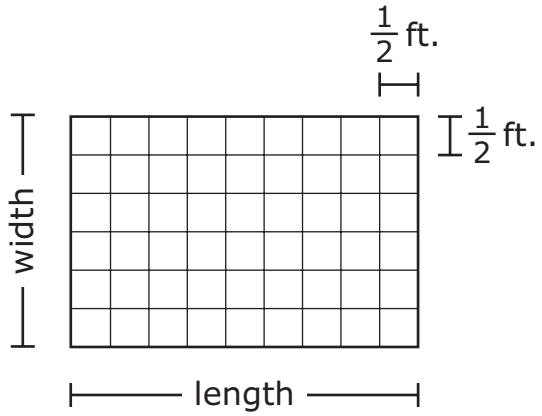
Ⓒ 0.002 mg = 2 g

Ⓓ 20 mg = 2,000 g

Ⓔ 20 kg = 20,000 g

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

**12** The floor of Sophia's bathroom is in the shape of a rectangle. She covered the floor with square tiles, as shown.




A. What is the width, in feet, of the floor?

B. Write an equation that can be used to find *s*, the area in square feet of the floor.

C. Use your equation from Part B to find *s*, the area in square feet of the floor. Show or explain how you got your answer.

Sophia bought a rug. The rug covers $\frac{2}{3}$ of the floor.

D. What is the area, in square feet, of the rug? Show or explain how you got your answer.

12



STOP!

## Grade 5 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 | 5.NBT.A.3 |
| 2 | SR | D | 1 | 5.NF.A.1 |
| 3 | SR | C | 1 | 5.MD.B.2 |
| 4 | SR | Part A: D<br>Part B: A | 2 | 5.G.A.2 |
| 5 | SR | A, E | 1 | 5.NF.B.5 |
| 6 | SR | B | 1 | 5.OA.A.2 |

**Session 2**

| Item Number | Item Type | Answer Key | Number of Points | Standard |
|---|---|---|---|---|
| 7 | SR | A, D, E | 1 | 5.NF.B.5 |
| 8 | SA | 180 | 1 | 5.MD.C.5 |
| 9 | SR | C | 1 | 5.NF.B.4 |
| 10 | SR | A, D, F | 1 | 5.NBT.A.4 |
| 11 | SR | A, E | 1 | 5.MD.A.1 |
| 12 | CR | *See Rubric* | 4 | 5.NF.B.4 |

Rubric is on the next page.

**Scoring Rubric for Grade 5 Practice Test** **Session 2 - Question #12**

| Scoring Guide | |
|---|---|
| Score | Description |
| **4** | The student response demonstrates an exemplary understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. The student correctly finds the product of a mixed number and a fraction, writes an equation, and finds area using mixed numbers and fractions. |
| **3** | The student response demonstrates a good understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. 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 Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. 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 Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. |
| **0** | The student response contains insufficient evidence of an understanding of the Numbers and Operations—Fractions concepts involved in applying and extending previous understandings of multiplication to multiply a fraction or whole number by a fraction. As a result, the response does not merit any points. |

**Sample Response:**

**a.** 3 (feet)

**b.** $4\frac{1}{2} \times 3 = s$

**c.** $13\frac{1}{2}$ (square feet) or equivalent, $4\frac{1}{2} \times 3 = s$, $\frac{9}{2} \times \frac{3}{1} = \frac{27}{2}$, $\frac{27}{2} = 13\frac{1}{2}$

**d.** 9 (square feet), $\frac{2}{3} \times 13\frac{1}{2} = \frac{2}{3} \times \frac{27}{2}$, $\frac{2}{3} \times \frac{27}{2} = \frac{54}{6}$, $\frac{54}{6} = 9$