Massachusetts MCAS Grade 4 Math Practice

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MASSACHUSETTS COMPREHENSIVE ASSESSMENT SYSTEM

PRACTICE TEST

Mathematics

Grade 4

Student Name

School Name

District Name

MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION

Grade 4 Mathematics

SESSION 1

This session contains 7 questions.

*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.

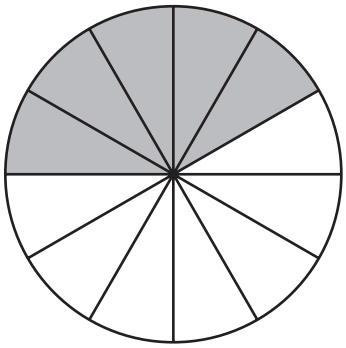
For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

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.

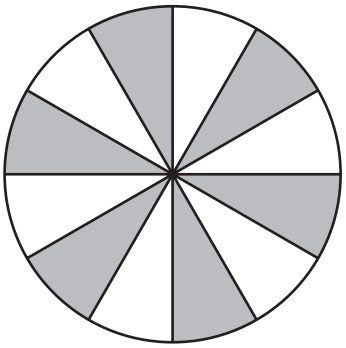
1 A family ordered a pizza. They ate $\frac{5}{6}$ of the pizza.

In which of these fraction models do the shaded parts represent the fraction of the pizza the family ate?

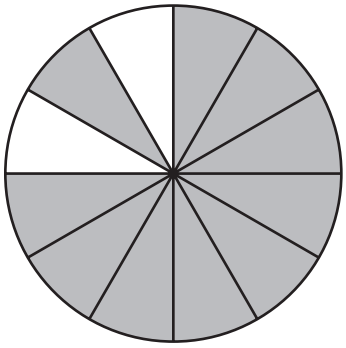
Ⓐ



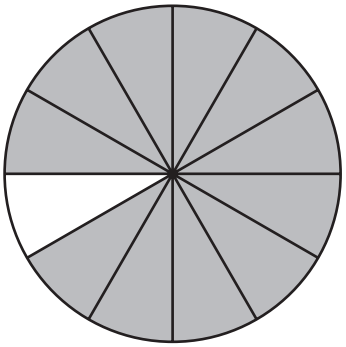
Ⓑ



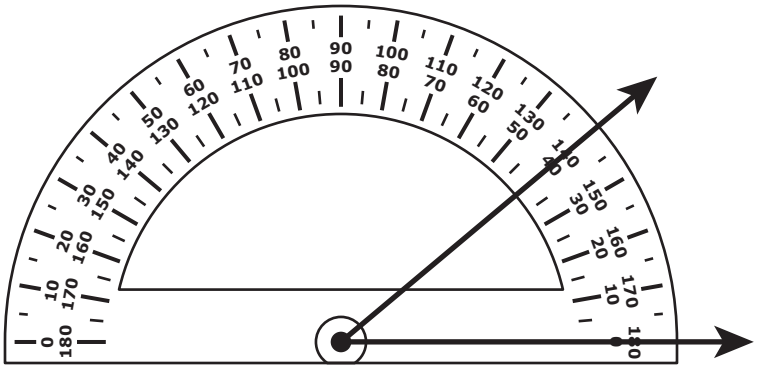
Ⓒ



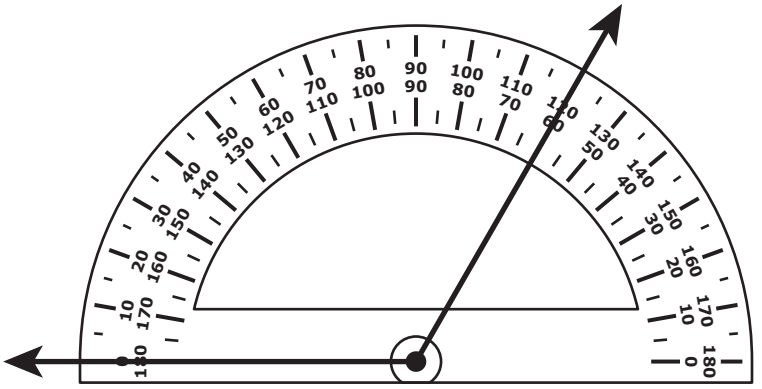
Ⓓ



2 Two protractors are used to measure angle A and angle B, as shown.



Angle A



Angle B

Which of these shows the measures of angle A and angle B?

Ⓐ angle A: 40° angle
angle B: 60° angle

Ⓑ angle A: 40° angle
angle B: 120° angle

Ⓒ angle A: 140° angle
angle B: 120° angle

Ⓓ angle A: 60° angle
angle B: 140° angle

3 A rectangle is divided into twelve equal sections.

- A student colors 5 sections.
- Then the student colors 4 more sections.

Which of these expressions represent the total fraction of the rectangle that the student colors?

Select the **two** correct answers.

Ⓐ $5 + 4$

Ⓑ $\frac{5}{12} + \frac{4}{12}$

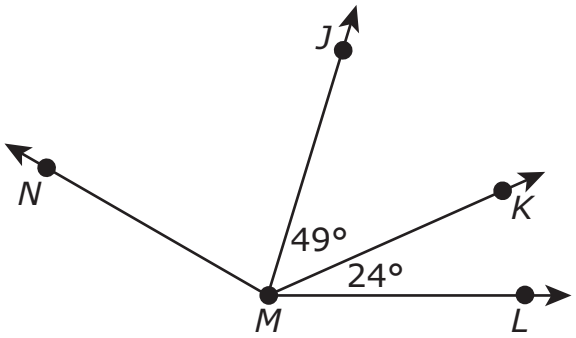
Ⓒ $\frac{12}{5} + \frac{12}{4}$

Ⓓ $\frac{1}{12} + 5 + 4$

Ⓔ $\frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12}$

This question has two parts.

4 The measures of two angles are labeled in this diagram.



Part A

Which equation can be used to find the measure, in degrees, of angle *JML*?

Ⓐ 24 + 49 = 73

Ⓑ 25 + 49 = 74

Ⓒ 49 − 24 = 25

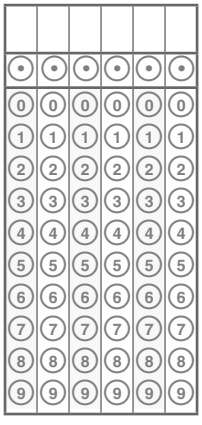
Ⓓ 49 − 25 = 24

Part B

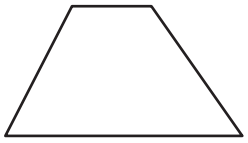
The sum of the measures of angle *NMJ* and angle *JMK* is 125°.

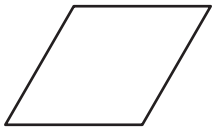
What is the measure, in degrees, of angle *NMJ*?

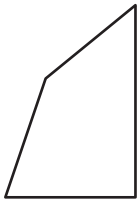
Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.

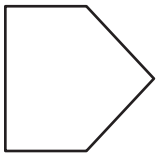


5 Which of these figures appears to have at least two sides that are parallel **and** at least two sides that are perpendicular?

Ⓐ 

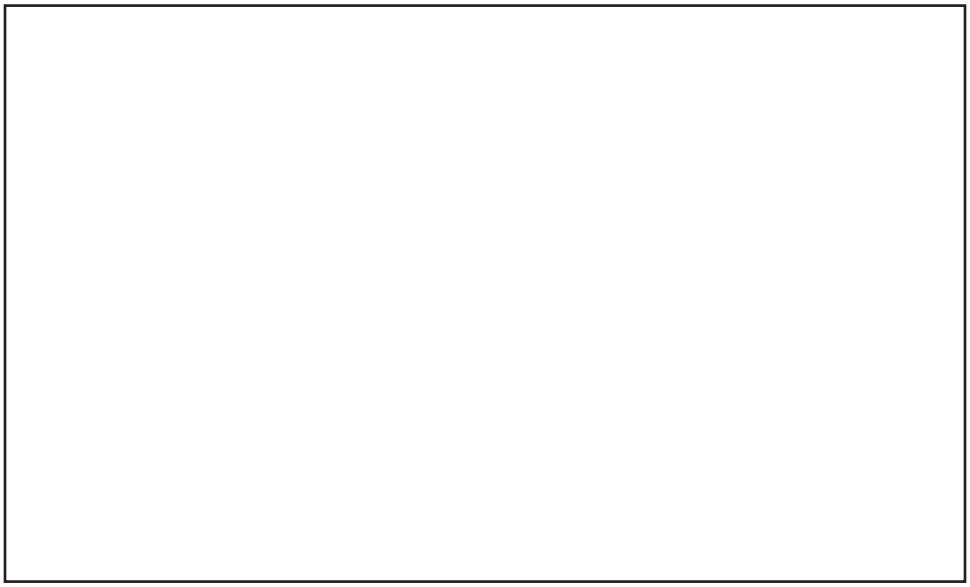
Ⓑ 

Ⓒ 

Ⓓ 

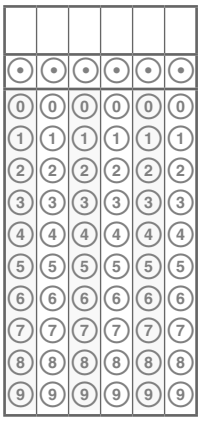
Use your ruler to answer question 6.

6 A teacher drew a rectangle on the board, as shown.



What is the area, in square inches, of the rectangle the teacher drew?

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



7 A student wrote the expression shown.

$$\frac{6}{10} + \frac{7}{100}$$

Which of the following is equivalent to the expression the student wrote?

Ⓐ $\frac{6}{10} + \frac{7}{10}$

Ⓑ $\frac{60}{10} + \frac{7}{100}$

Ⓒ $\frac{60}{100} + \frac{7}{100}$

Ⓓ $\frac{60}{100} + \frac{70}{100}$

STOP!

Grade 4 Mathematics

SESSION 2

This session contains 8 questions.

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Directions

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8 Which of these comparisons are correct?

Select the **three** correct answers.

Ⓐ $2.09 < 2.12$

Ⓑ $2.09 > 2.12$

Ⓒ $8.10 > 8.1$

Ⓓ $8.10 = 8.1$

Ⓔ $6.45 > 6.7$

Ⓕ $6.45 < 6.7$

9 Krista has 32 crayons. Devon has 4 times as many crayons as Krista.

Which equation can be used to find d, the total number of crayons that Devon has?

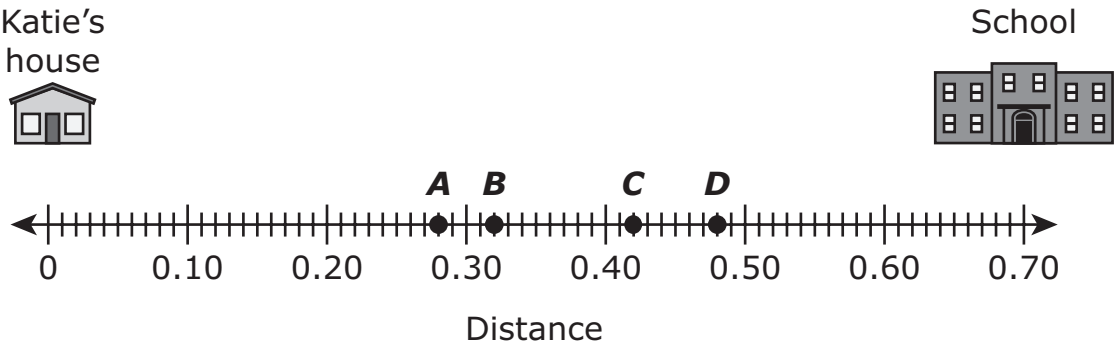
Ⓐ $d = 32 \div 4$

Ⓑ $d = 32 \times 4$

Ⓒ $4 = 32 \div d$

Ⓓ $32 = 4 \times d$

10 Katie's house is 0.70 mile from her school, as shown on this number line.



She passes a bakery on her way to school. The bakery is 0.28 mile from the school.

Which point on the number line represents the location of the bakery?

Ⓐ point *A*

Ⓑ point *B*

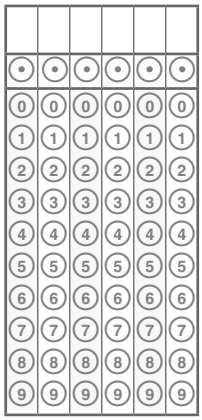
Ⓒ point *C*

Ⓓ point *D*

11 Find the product.

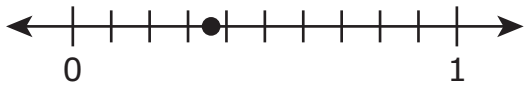
$$65 \times 98$$

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

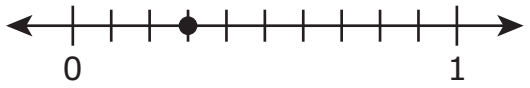


12 Which of these number lines has a point that represents the location of 0.36?

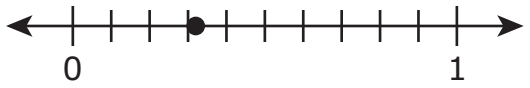
Ⓐ



Ⓑ



Ⓒ



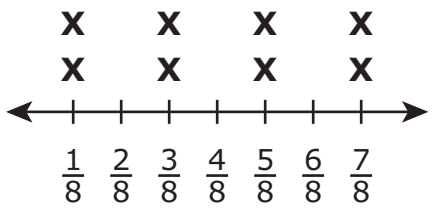
Ⓓ

13 A scientist measured the lengths of seeds from different plants. The lengths, in inches, of the seeds the scientist measured are shown in this list.

$\frac{7}{8}, \frac{3}{8}, \frac{1}{8}, \frac{7}{8}, \frac{3}{8}, \frac{1}{8}, \frac{3}{8}, \frac{3}{8}, \frac{5}{8}, \frac{7}{8}, \frac{7}{8}, \frac{1}{8}$

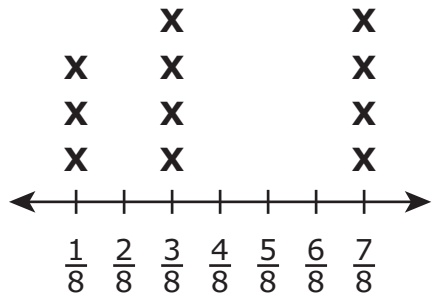
Which line plot shows the lengths, in inches, of the seeds from different plants?

Ⓐ **Plant Seed Lengths**



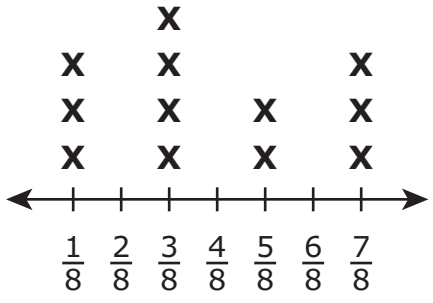
Length of Seeds (inches)

Ⓑ **Plant Seed Lengths**



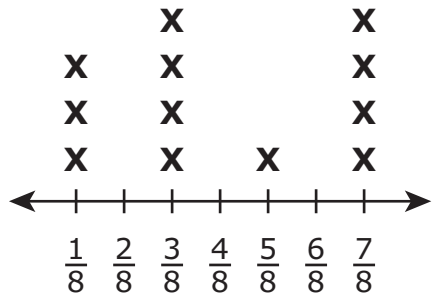
Length of Seeds (inches)

Ⓒ **Plant Seed Lengths**



Length of Seeds (inches)

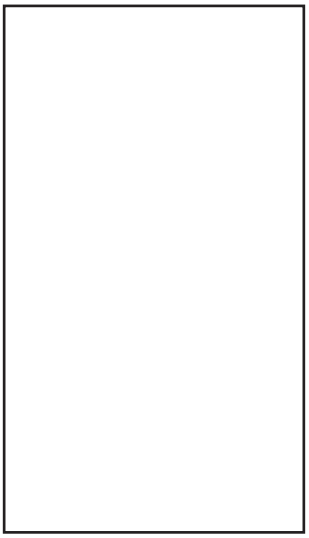
Ⓓ **Plant Seed Lengths**



Length of Seeds (inches)

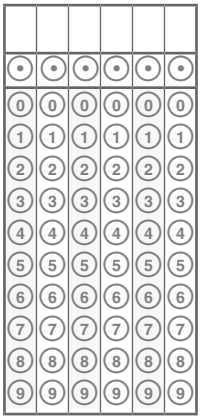
Use your ruler to answer question 14.

14 A student drew this rectangle.



What is the perimeter, in centimeters, of the rectangle the student drew?

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



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

15 Carl sold cookies and pies at a bake sale to earn money.

- A bag of cookies sells for $3.
- A pie sells for $8.

Carl sold 4 bags of cookies and 2 pies during the first hour of the bake sale.

A. What is the total amount of money, in dollars, Carl earned during the first hour of the bake sale? Show or explain how you got your answer.

Ms. O'Hara bought 2 bags of cookies and 1 pie from Carl. She paid with a $20 bill.

B. What is the total amount of change, in dollars, Ms. O'Hara should receive? Show or explain how you got your answer.

Vanessa sold cakes at the same bake sale.

- Mr. Stanley bought 1 bag of cookies and 2 pies from Carl.
- Mr. Stanley also spent $11 to buy a cake from Vanessa at the bake sale.

C. Write an equation to show m, the total amount of money, in dollars, Mr. Stanley spent at the bake sale.

D. Solve the equation you wrote in Part C to find the total amount of money, in dollars, Mr. Stanley spent at the bake sale. Show your work.

Write your answers on the next page.

15

STOP!

Grade 4 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	Standard
1	SR	C	1	4.NF.A.1
2	SR	B	1	4.MD.C.6
3	SR	B, E	1	4.NF.B.3
4	SA	Part A: A Part B: 76	2	4.MD.C.7
5	SR	D	1	4.G.A.2
6	SA	15	1	4.MD.A.3
7	SR	C	1	4.NF.C.5

Session 2

Item Number	Item Type	Answer Key	Number of Points	Standard
8	SR	A, D, F	1	4.NF.C.7
9	SR	B	1	4.OA.A.2
10	SR	C	1	4.MD.A.2
11	SA	6370	1	4.NBT.B.5
12	SR	A	1	4.NF.C.6
13	SR	D	1	4.MD.B.4
14	SA	*22*	1	4.MD.A.3
15	CR	*See Rubric*	4	4.OA.A.3

Rubric is on the next page.

Scoring Rubric for Grade 4 Practice Test **Session 2 – Question #15**

Scoring Guide	
Score	Description
4	The student response demonstrates an exemplary understanding of the Operations and Algebraic Thinking concepts involved in solving multi-step word problems posed with whole numbers and having whole-number answers using the four operations, and representing these problems using equations with a letter standing for the unknown quantity. The student solves real-world problems using multiple operations and money.
3	The student response demonstrates a good understanding of the Operations and Algebraic Thinking concepts involved in solving multi-step word problems posed with whole numbers and having whole-number answers using the four operations, and representing these problems using equations with a letter standing for the unknown quantity. 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 Operations and Algebraic Thinking concepts involved in solving multi-step word problems posed with whole numbers and having whole-number answers using the four operations, and representing these problems using equations with a letter standing for the unknown quantity. 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 Operations and Algebraic Thinking concepts involved in solving multi-step word problems posed with whole numbers and having whole-number answers using the four operations, and representing these problems using equations with a letter standing for the unknown quantity.
0	The student response contains insufficient evidence of an understanding of the Operations and Algebraic Thinking concepts involved in solving multi-step word problems posed with whole numbers and having whole-number answers using the four operations, and representing these problems using equations with a letter standing for the unknown quantity to merit any points.

Sample Response:

a. ($)28, $(4 \times 3) + (2 \times 8) = 12 + 16 = 28$

b. ($)6, $20 - (2 \times 3 + 8) = 6$

c. $3 + (2 \times 8) + 11 = m$ or equivalent

d. ($)30, $3 + (2 \times 8) + 11 = m$

$3 + 16 + 11 = m$

$30 = m$