
IX. Mathematics, Grade 3

Grade 3 Mathematics Test

The spring 2010 grade 3 MCAS Mathematics test was based on learning standards in the Massachusetts *Mathematics Curriculum Framework* (2000). The *Framework* identifies five major content strands, listed below. Specific learning standards for grade 3 are found in the *Supplement to the Massachusetts Mathematics Curriculum Framework* (2004). Page numbers for the grades 3–4 *Framework* learning standards and for the grade 3 *Supplement* standards appear in parentheses.

- Number Sense and Operations (*Framework*, pages 22–23; *Supplement*, pages 3–4)
- Patterns, Relations, and Algebra (*Framework*, page 32; *Supplement*, page 4)
- Geometry (*Framework*, page 40; *Supplement*, pages 4–5)
- Measurement (*Framework*, page 48; *Supplement*, page 5)
- Data Analysis, Statistics, and Probability (*Framework*, page 56; *Supplement*, pages 5–6)

The *Mathematics Curriculum Framework* and *Supplement* are available on the Department website at www.doe.mass.edu/frameworks/current.html.

In test item analysis reports and on the Subject Area Subscore pages of the MCAS *School Reports* and *District Reports*, Mathematics test results are reported under five MCAS reporting categories, which are identical to the five *Mathematics Curriculum Framework* content strands listed above.

Test Sessions

The MCAS grade 3 Mathematics test included two separate test sessions. Each session included multiple-choice, short-answer, and open-response questions. Approximately half of the common test items are shown on the following pages as they appeared in grade 3 test & answer booklets.

Reference Materials and Tools

Each student taking the grade 3 Mathematics test was provided with a plastic ruler and a grade 3 Mathematics Tool Kit. A copy of the tool kit pieces used by students to answer question 14 immediately follows the last question in this chapter. An image of the ruler is not reproduced in this publication.

The use of bilingual word-to-word dictionaries was allowed for current and former limited English proficient students only, during both Mathematics test sessions. No calculators, other reference tools, or materials were allowed.

Cross-Reference Information

The tables at the conclusion of this chapter indicate each released and unreleased common item's reporting category and the framework learning standard it assesses. The correct answers for released multiple-choice and short-answer questions are also displayed in the released item table.

Mathematics

SESSION 1

You may use your tool kit and MCAS ruler during this session.

You may **not** use a calculator during this session.



DIRECTIONS

This session contains six multiple-choice questions and one open-response question. For multiple-choice questions, mark your answers by filling in the circle next to the best answer. For the open-response question, write your answer in the space provided below the question.

- 1 What is the missing number that makes the number sentence below true?

$$\boxed{?} + 19 + 7 = 33$$

- (A) 6
- (B) 7
- (C) 58
- (D) 59

- 2 The chart below shows the numbers of visitors at four parks last year.

Park Visitors Last Year

Park	Number
River Park	8346
Oak Park	9103
Lake Park	9088
Green Park	6299

Which park had the most visitors last year?

- (A) River Park
- (B) Oak Park
- (C) Lake Park
- (D) Green Park

- 3 Tammy has 5 boxes of markers. There are 8 markers in each box.
Which of these shows two ways to find the total number of markers that Tammy has?

- (A) $5 + 8 = \square$ and $8 + 5 = \square$
- (B) $5 + 8 = \square$ and $8 - 5 = \square$
- (C) $8 \times 5 = \square$ and $8 \div 5 = \square$
- (D) $8 \times 5 = \square$ and $5 \times 8 = \square$

- 4 Ms. Duff wrote how many seconds it took each of 12 students to complete a set of math problems. The times are shown below.

Times in Seconds

39	38	58
48	37	47
59	49	58
43	50	46

Ms. Duff is writing tally marks for the times in the chart below.

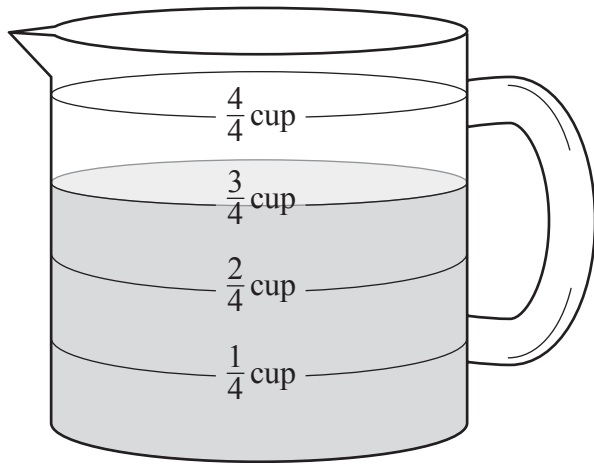
Times to Complete Math Problems

Time in Seconds	Number of Students
30–39	
40–49	
50–59	?

How many tally marks should Ms. Duff write in the row for 50–59 seconds?

- (A) |||
- (B) ||||
- (C) ||||
- (D) |||| |||

- 5 There is $\frac{3}{4}$ cup of milk in the measuring cup shown below.



Rachel poured $\frac{2}{4}$ cup of milk out of the measuring cup.

How much milk is left?

- Ⓐ $\frac{1}{4}$ cup
- Ⓑ $\frac{2}{4}$ cup
- Ⓒ $\frac{3}{4}$ cup
- Ⓓ $\frac{4}{4}$ cup

Write your answers to parts (a) and (b) of open-response question 7 in the spaces provided.

7 Jamie is measuring her pet mouse.

a. Should Jamie measure her mouse’s length in inches, yards, or pounds?
Explain how you know your answer is correct.

b. Should Jamie measure her mouse’s weight in feet, ounces, or tons?
Explain how you know your answer is correct.

Mathematics

SESSION 2

You may use your tool kit and MCAS ruler during this session.

You may **not** use a calculator during this session.



DIRECTIONS

This session contains seven multiple-choice questions, three short-answer questions, and one open-response question. For multiple-choice questions, mark your answers by filling in the circle next to the best answer. For the short-answer and open-response questions, write your answer in the space provided below the question.

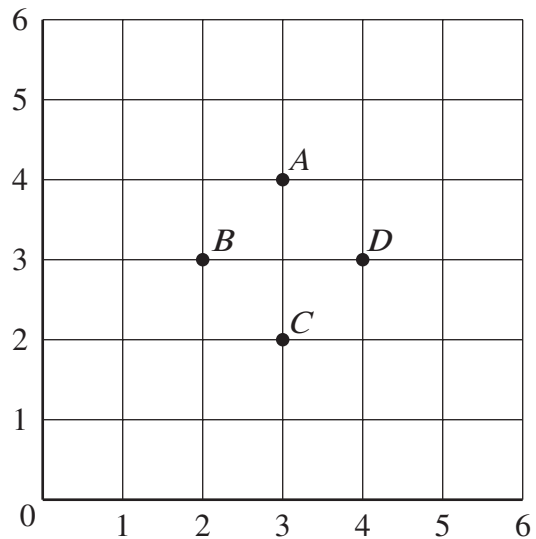
- 8 Alex wrote the number pattern shown below.

4, 7, 10, 13, 16

Which of these could be the rule for Alex's pattern?

- A multiply by 2
- B subtract 3
- C add 3
- D multiply by 3

- 9 Points A , B , C , and D are shown on the grid below.



Which point is at (4, 3)?

- A point A
- B point B
- C point C
- D point D

- 10 Hector is reading a book that has 336 pages. He has read 154 pages so far.

How many pages does Hector have left to read?

- (A) 172
- (B) 182
- (C) 222
- (D) 282

- 11 The kinds and sizes of juice boxes Doug can choose are shown below.

Juice Boxes

Kind	Size
apple	small
grape	medium
orange	large

How many different ways can Doug choose 1 kind and 1 size of juice box?

- (A) 3
- (B) 6
- (C) 9
- (D) 12

Question 12 is a short-answer question. Write your answer to this question in the Answer Box provided.

- 12 Jessie has 13 acorns. Tina has 8 acorns.

In the Answer Box below, write a number sentence that can be used to find how many more acorns Jessie has than Tina has.

This is a number sentence:

$$1 + 2 = 3$$

This is **not** a number sentence:

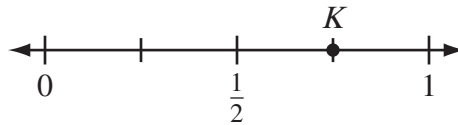
$$\begin{array}{r} 1 \\ +2 \\ \hline 3 \end{array}$$

Answer Box

12

Question 13 is a short-answer question. Write your answer to this question in the Answer Box provided.

- 13 Point K is shown on the number line below.



In the Answer Box below, write the **fraction** that best names point K .

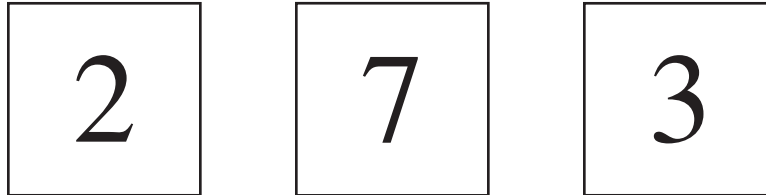
Answer Box

13

Write your answers to parts (a) and (b) of open-response question 14 in the spaces provided.

You may use the number cards labeled 2, 7, and 3 from your tool kit to help you answer question 14.

14 Charlie used cards to make the number shown below.



a. Round 273 to the nearest hundred.

Charlie used the same cards to make a new number.

- The new number is different from 273.
- The new number rounds to the same hundred as 273.

b. What is the new number Charlie made?

Question 15 is a short-answer question. Write your answer to this question in the Answer Box provided.

- 15 In the Answer Box below, draw an angle that is less than a right angle.

Answer Box



15

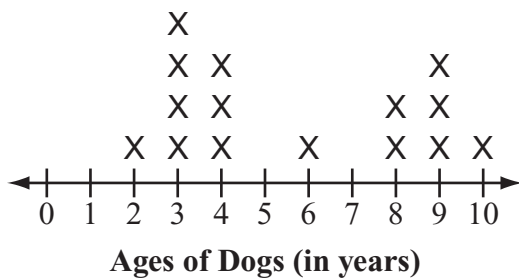
Mark your choices for multiple-choice questions 16 through 18 by filling in the circle next to the best answer.

- 16 Which symbol belongs in the (?) below to make a true number sentence?

$$4 \times 8 \quad (?) \quad 45 - 15$$

- (A) >
- (B) =
- (C) <
- (D) -

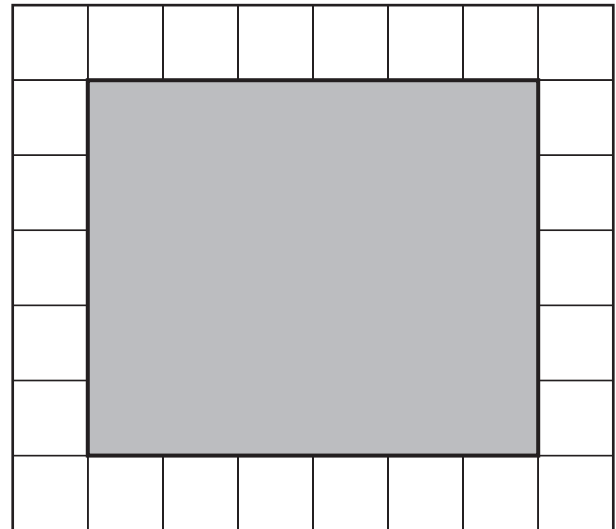
- 17 The line plot below shows the ages of the dogs in an animal shelter.




How many dogs are **more than** 5 years old?

- (A) 4
- (B) 5
- (C) 6
- (D) 7

- 18 Miguel drew a shaded rectangle on a grid, as shown below.



 stands for 1 square unit

What is the area of the shaded rectangle?

- (A) 11 square units
- (B) 22 square units
- (C) 26 square units
- (D) 30 square units



2

7

3

During testing, students were provided additional tool kit pieces to answer test items that are not released.

Grade 3 Mathematics
Spring 2010 Released Items:
Reporting Categories, Standards, and Correct Answers*

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC/SA)*
1	132	<i>Patterns, Relations, and Algebra</i>	3.P.3	B
2	132	<i>Number Sense and Operations</i>	3.N.1	B
3	133	<i>Number Sense and Operations</i>	3.N.7	D
4	133	<i>Data Analysis, Statistics, and Probability</i>	3.D.1	B
5	134	<i>Number Sense and Operations</i>	3.N.13	A
6	135	<i>Data Analysis, Statistics, and Probability</i>	3.D.2	A
7	136	<i>Measurement</i>	3.M.1	
8	137	<i>Patterns, Relations, and Algebra</i>	3.P.1	C
9	137	<i>Geometry</i>	3.G.5	D
10	138	<i>Number Sense and Operations</i>	3.N.8	B
11	138	<i>Data Analysis, Statistics, and Probability</i>	3.D.4	C
12	139	<i>Patterns, Relations, and Algebra</i>	3.P.4	$13 - 8 = \square$ or $13 - 8 = 5$
13	140	<i>Number Sense and Operations</i>	3.N.4	3/4
14	141	<i>Number Sense and Operations</i>	3.N.11	
15	142	<i>Geometry</i>	3.G.3	A drawing of any acute angle
16	143	<i>Patterns, Relations, and Algebra</i>	3.P.2	A
17	143	<i>Data Analysis, Statistics, and Probability</i>	3.D.3	D
18	143	<i>Measurement</i>	3.M.4	D

* Answers are provided here for multiple-choice items and short-answer items only. Sample responses and scoring guidelines for open-response items, which are indicated by shaded cells, will be posted to the Department's website later this year.

Grade 3 Mathematics
Spring 2010 Unreleased Common Items:
Reporting Categories and Standards

Item No.	Reporting Category	Standard
19	<i>Geometry</i>	3.G.7
20	<i>Number Sense and Operations</i>	3.N.1
21	<i>Data Analysis, Statistics, and Probability</i>	3.D.1
22	<i>Patterns, Relations, and Algebra</i>	3.P.2
23	<i>Number Sense and Operations</i>	3.N.2
24	<i>Data Analysis, Statistics, and Probability</i>	3.D.3
25	<i>Geometry</i>	3.G.6
26	<i>Patterns, Relations, and Algebra</i>	3.P.4
27	<i>Number Sense and Operations</i>	3.N.11
28	<i>Number Sense and Operations</i>	3.N.9
29	<i>Number Sense and Operations</i>	3.N.5
30	<i>Geometry</i>	3.G.4
31	<i>Data Analysis, Statistics, and Probability</i>	3.D.3
32	<i>Measurement</i>	3.M.3
33	<i>Number Sense and Operations</i>	3.N.8
34	<i>Measurement</i>	3.M.5
35	<i>Number Sense and Operations</i>	3.N.12
36	<i>Patterns, Relations, and Algebra</i>	3.P.1