PRACTICE TEST

Mathematics

Grade 7

_____

Student Name

_____

School Name

_____

District Name

MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION
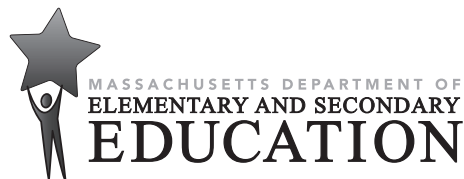
Grade 7 Mathematics
SESSION 1

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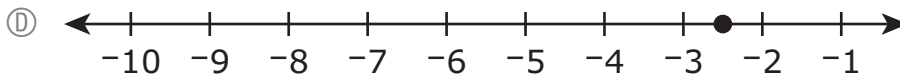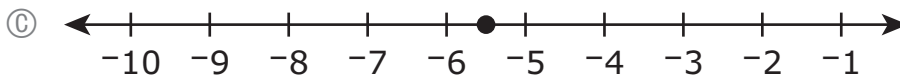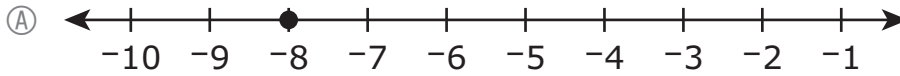
For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

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.

*Go On* ➡

1 Consider this equation.

$$x = 2.5 - (8)$$

Which of the following shows the value of x graphed on a number line?

Ⓐ

| | | | | | | | | | | |
|−10|−9|−8|−7|−6|−5|−4|−3|−2|−1|

Ⓑ

| | | | | | | | | | | |
|−10|−9|−8|−7|−6|−5|−4|−3|−2|−1|

Ⓒ

| | | | | | | | | | | |
|−10|−9|−8|−7|−6|−5|−4|−3|−2|−1|

Ⓓ

| | | | | | | | | | | |
|−10|−9|−8|−7|−6|−5|−4|−3|−2|−1|

2 Customers must spend a minimum of $25 at an online art supply store to receive free shipping. A customer ordered 10 tubes of paint and an easel.

- Each tube of paint cost the same amount.
- The easel cost $15.

Which of the following number lines shows all the possible costs, in dollars, of one tube of paint if the customer received free shipping?
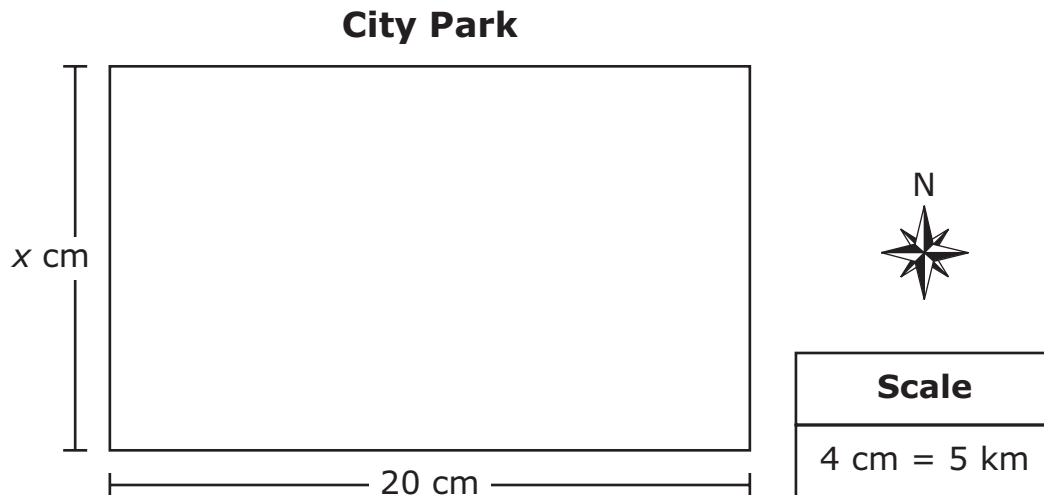
Ⓐ

Ⓑ

Ⓒ

Ⓓ
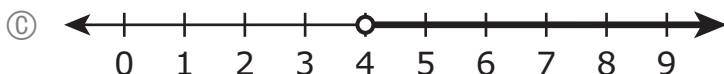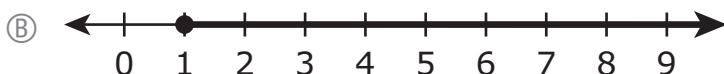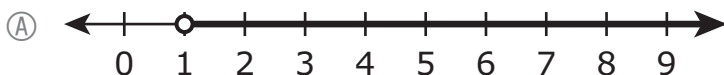
This question has two parts.

3   A map of a city park and its scale are shown.

City Park

x cm

20 cm

N

Scale

4 cm = 5 km

Part A

On the map, the south side has a length of 20 centimeters. What is the **actual distance**, in kilometers, of the south side of the park?

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

Go On ➡

Part B

The west side of the park has an actual distance of 15 kilometers. On the map, what is the length, in **centimeters**, of the west side of the park?

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

4   Which of the following equations is true?

Ⓐ $-3 - (-4x + 6) = (6 - 4x) - 3$

Ⓑ $-3 - (-4x + 6) = (6 + 4x) - 3$

Ⓒ $-3 - (-4x + 6) = (-6 - 4x) - 3$

Ⓓ $-3 - (-4x + 6) = (-6 + 4x) - 3$

5 Yesterday, the temperature at sunrise was −3°F. At sunset, the temperature was 25 degrees warmer than the temperature at sunrise.

Which of the following shows the temperature, in degrees Fahrenheit, at sunset?
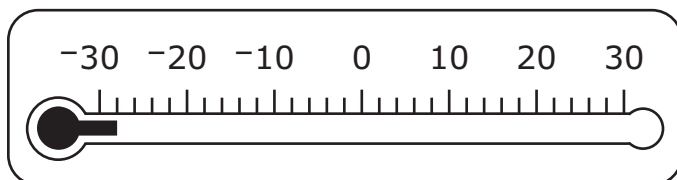
Ⓐ **Temperature at Sunset (°F)**

```
 −30  −20  −10   0   10   20   30
```

Ⓑ **Temperature at Sunset (°F)**

```
 −30  −20  −10   0   10   20   30
```

Ⓒ **Temperature at Sunset (°F)**

```
 −30  −20  −10   0   10   20   30
```

Ⓓ **Temperature at Sunset (°F)**

```
 −30  −20  −10   0   10   20   30
```

Go On ➡
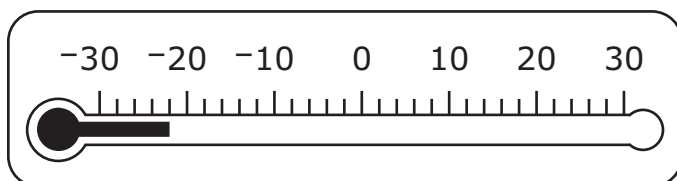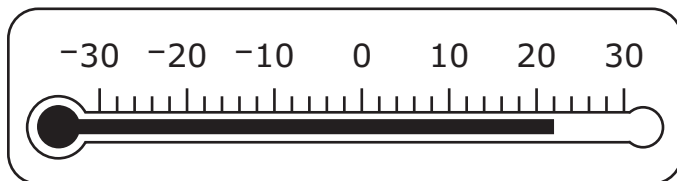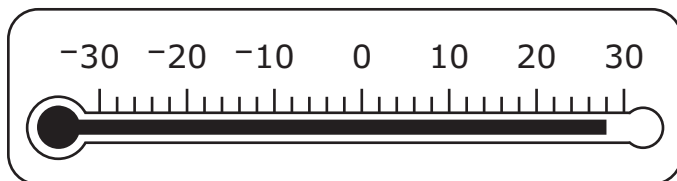
6 A librarian is reading a book during her lunch breaks. She recorded some of her reading rates over the past three days in this table.

Reading Rates

Day	Number of Pages Read	Time (hour)	Rate (pages per hour)
Monday	$8\frac{1}{4}$	$\frac{1}{6}$	
Tuesday		$\frac{1}{2}$	60
Wednesday	80		40

Which of the following completed tables correctly shows her reading rates?

Ⓐ
Reading Rates

Day	Number of Pages Read	Time (hour)	Rate (pages per hour)
Monday	$8\frac{1}{4}$	$\frac{1}{6}$	$49\frac{1}{2}$
Tuesday	120	$\frac{1}{2}$	60
Wednesday	80	2	40

Ⓑ
Reading Rates

Day	Number of Pages Read	Time (hour)	Rate (pages per hour)
Monday	$8\frac{1}{4}$	$\frac{1}{6}$	$49\frac{1}{2}$
Tuesday	30	$\frac{1}{2}$	60
Wednesday	80	3,200	40

Ⓒ
Reading Rates

Day	Number of Pages Read	Time (hour)	Rate (pages per hour)
Monday	$8\frac{1}{4}$	$\frac{1}{6}$	$49\frac{1}{2}$
Tuesday	30	$\frac{1}{2}$	60
Wednesday	80	2	40

Ⓓ
Reading Rates

Day	Number of Pages Read	Time (hour)	Rate (pages per hour)
Monday	$8\frac{1}{4}$	$\frac{1}{6}$	$49\frac{1}{2}$
Tuesday	120	$\frac{1}{2}$	60
Wednesday	80	3,200	40

STOP!

Grade 7 Mathematics
SESSION 2

This session contains 6 questions.

You may use your reference sheet during this session.
You may 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.

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Go On ➡

7 A cube will be sliced once.

Select the **three** two-dimensional figures that could result from slicing the cube.

Ⓐ circle

Ⓑ prism

Ⓒ triangle

Ⓓ octagon

Ⓔ pentagon

Ⓕ parallelogram

8 Dana has 8 baseball cards, 10 football cards, 4 hockey cards, and 14 basketball cards. All the cards are the same size and shape. Dana will select one card at random.
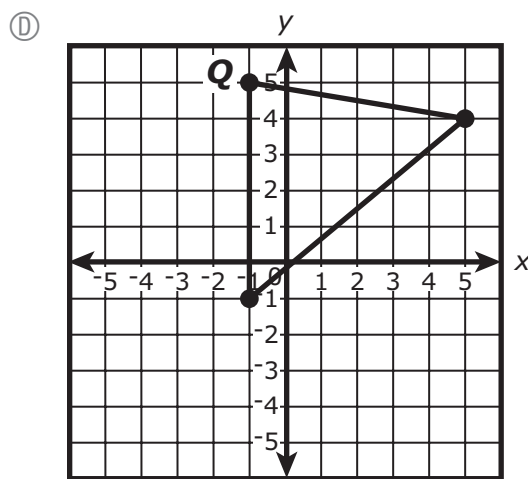
What is the probability that the card selected will be a hockey card?

Ⓐ $\frac{1}{9}$

Ⓑ $\frac{1}{8}$

Ⓒ $\frac{1}{4}$

Ⓓ $\frac{1}{3}$

9   A student drew triangle *PQR* on a coordinate plane. The triangle had the following conditions:

- The measure of ∠*Q* is 90 degrees.

- The length of $\overline{QR}$ is 6 units.

- The length of $\overline{PQ}$ is 8 units.

Which of the following coordinate planes shows the triangle the student drew?

Ⓐ

Ⓑ

Ⓒ

Ⓓ

Go On ➡
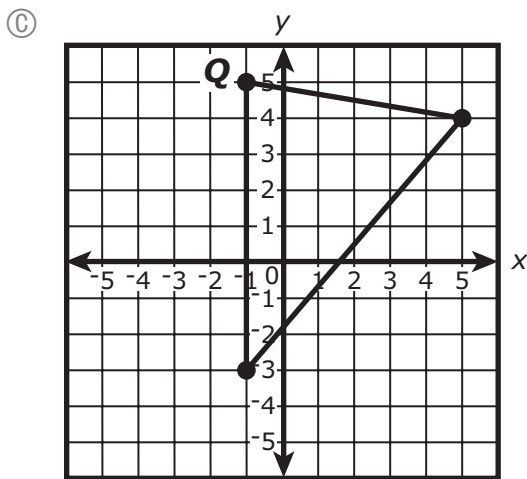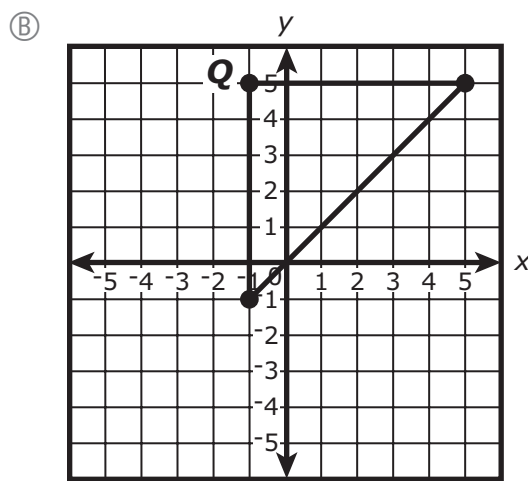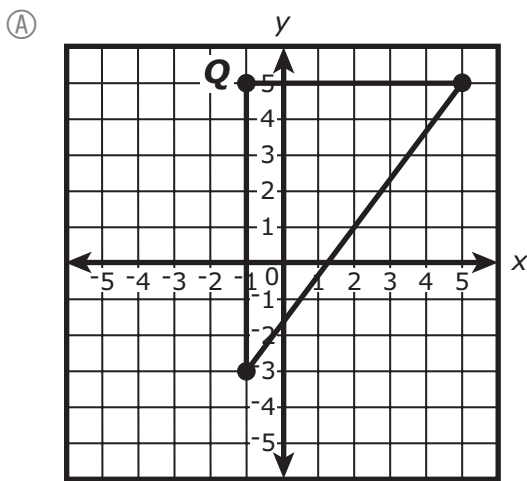
10 A bicycle is on sale at a store for 15% off its original price. The original price, in dollars, of the bicycle is represented by the variable p.

Which of the following expressions represents the final sale price, in dollars, of the bicycle?

Select the **two** correct answers.

Ⓐ $p - 0.15p$

Ⓑ $p - 0.15$

Ⓒ $p - 0.85p$

Ⓓ $0.15p$

Ⓔ $0.85p$

11 A bottle contains 120 fluid ounces of laundry detergent. Which of the following is closest to the number of liters in 120 fluid ounces? (1 fluid ounce ≈ 0.0296 liter)

Ⓐ 3.55 liters

Ⓑ 4.05 liters

Ⓒ 4.16 liters

Ⓓ 4.47 liters

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

12 Billy left home at 9 a.m. and rode his bicycle to the park at an average speed of 10 miles per hour. He arrived at the park at 9:30 a.m.

A. How many miles from the park is Billy's home? Show or explain how you got your answer.

Derrick lives 3 miles from the park. He rode his bicycle to the park at an average speed of 9 miles per hour.

B. How many minutes did it take Derrick to ride his bicycle to the park? Show or explain how you got your answer.

Juan lives 2.5 miles from the park. It took him 12 minutes to ride his bicycle to the park.

C. What was Juan's average speed, in miles per hour, while riding his bicycle to the park? Show or explain how you got your answer.

12

Grade 7 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	C	1	7.NS.A.1
2	SR	B	1	7.EE.B.4
3	SA	Part A: 25 Part B: 12	2	7.G.A.1
4	SR	D	1	7.EE.A.2
5	SR	C	1	7.NS.A.3
6	SR	C	1	7.RP.A.1

Session 2

Item Number	Item Type	Answer Key	Number of Points	Standard
7	SR	C, E, F	1	7.G.A.3
8	SR	A	1	7.SP.C.7
9	SR	A	1	7.G.A.2
10	SR	A, E	1	7.EE.A.2
11	SR	A	1	7.RP.A.1
12	CR	*See Rubric*	4	7.RP.A.3

Rubric is on the next page.

	Scoring Guide
Score	Description
4	The student response demonstrates an exemplary understanding of the Ratios and Proportional Relationships concepts involved in using proportional relationships to solve multi-step ratio and percent problems. The student uses proportional relationships in three different situations to solve for either distance, time, or rate.
3	The student response demonstrates a good understanding of the Ratios and Proportional Relationships concepts involved in using proportional relationships to solve multi-step ratio and percent 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 Relationships concepts involved in using proportional relationships to solve multi-step ratio and percent 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 Relationships concepts involved in using proportional relationships to solve multi-step ratio and percent problems.
0	The student response contains insufficient evidence of an understanding of the Ratios and Proportional Relationships concepts involved in using proportional relationships to solve multi-step ratio and percent problems to merit any points.

Sample Response:

a. $d = 5$ miles; $d = rt, d = 10 \left(\frac{1}{2}\right) = 5$
b.   It will take Derrick 20 minutes to get to the park.

$$d = rt;\ 3 = 9t,\ t = \frac{1}{3} \text{ hour or 20 minutes}$$

OR

$$\frac{9}{60} = \frac{3}{x},\ 9x = 180,\ x = 20 \text{ minutes}$$

c. $r = 12.5$ miles per hour; $d = rt;\ 2.5 = r \left(\frac{1}{5}\right)$