# PRACTICE TEST <br> Mathematics 

## Grade 8

Student Name

School Name

District Name

## Grade 8 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 your Practice Test Answer Document.

For some questions, you will mark your answers by filling in the circles in your Practice Test Answer Document. 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 in your Practice Test Answer Document. Only responses written within the provided space will be scored.

## Directions for Completing Questions with Answer Grids

1. Work the question and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
5. Do not fill in a circle under an unused box.
6. Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
7. If you need to change an answer, be sure to erase your first answer completely.
8. See below for examples on how to correctly complete an answer grid.

## EXAMPLES

To answer -3 in a question, fill in the answer grid as shown below.


To answer . 75 in a question, fill in the answer grid as shown below.


1 Line $p$ and line $q$ are shown on this coordinate grid.


Which of the following statements best describes the lines?
A. Line $p$ has the same slope as line $q$.
B. Line $p$ has a greater slope than line $q$.
C. The $y$-intercept of line $p$ is greater than the $y$-intercept of line $q$.
D. The $x$-intercept of line $q$ is greater than the $x$-intercept of line $p$.
(2) Which equations define $y$ as a nonlinear function of $x$ ?

Select all that apply.
A. $y=7.4 x$
B. $y=2 x+5^{2}$
C. $y=10 x^{2}$
D. $y=5 x-3$
E. $y=\frac{x}{2}$
F. $y=2 x^{3}+1$
(3) Which statement best describes the value of $\sqrt{8}$ ?
A. The value of $\sqrt{8}$ is between 2 and 2.5.
B. The value of $\sqrt{8}$ is between 2.5 and 3 .
C. The value of $\sqrt{8}$ is between 3 and 3.5.
D. The value of $\sqrt{8}$ is between 3.5 and 4 .

4 Triangle $P Q R$ is shown on the coordinate plane.


Triangle $P Q R$ is rotated $90^{\circ}$ counterclockwise about the origin to form the image triangle $P^{\prime} Q^{\prime} R^{\prime}$ (not shown). Then triangle $P^{\prime} Q^{\prime} R^{\prime}$ is reflected across the $x$-axis to form triangle $P^{\prime \prime} Q^{\prime \prime} R^{\prime \prime}$ (not shown).

## Part A

What are the signs of the coordinates $(x, y)$ of point $P^{\prime}$ ?
A. Both $x$ and $y$ are positive.
B. $x$ is negative and $y$ is positive.
C. Both $x$ and $y$ are negative.
D. $x$ is positive and $y$ is negative.

## Part B

What are the signs of the coordinates $(x, y)$ of point $Q^{\prime \prime}$ ?
A. Both $x$ and $y$ are positive.
B. $x$ is negative and $y$ is positive.
C. Both $x$ and $y$ are negative.
D. $x$ is positive and $y$ is negative.

5 The students in a science club planted a rectangular flower garden in front of their school. The garden is 6 feet wide and has a diagonal length of 10 feet.


What is $x$, the length in feet of the garden?
Enter your answer in the box.

6 Each of these four functions shows a relationship between $x$ and $y$.

- Function H :

- Function I: $y=2.5 x+8$
- Function J: Multiply the $x$ value by 3 and subtract 6 to get the $y$ value.
- Function K:

| $x$ | $y$ |
| ---: | ---: |
| -2 | 4 |
| 0 | 6 |
| 2 | 8 |
| 4 | 10 |
| 6 | 12 |

## Part A

What is the slope of the line that represents Function H? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

## Part B

Write an equation in terms of $x$ and $y$ to represent the graph of Function J.
Enter your equation in the space provided. Enter only your equation.

## Part C

What is the $y$-intercept of Function K? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

## Part D

List the four functions in order from the function with the least rate of change to the function with the greatest rate of change.

Enter your answer in the space provided.

## Grade 8 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 your Practice Test Answer Document.

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## Directions for Completing Questions with Answer Grids

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8. See below for examples on how to correctly complete an answer grid.

## EXAMPLES

To answer -3 in a question, fill in the answer grid as shown below.


To answer .75 in a question, fill in the answer grid as shown below.


7 A solution is 20\% bleach.
Which graph represents the number of liters of bleach, $y$, contained in $x$ liters of solution?


8 The table shows the results of a random survey of students in grade 7 and grade 8 . Every student surveyed gave a response. Each student was asked if he or she exercised less than 5 hours last week or 5 or more hours last week.

|  | Less than 5 Hours | 5 or More Hours |
| :--- | :---: | :---: |
| Grade 7 Students | 49 | 63 |
| Grade 8 Students | 58 | 51 |

Based on the results of the survey, which statements are true?
Select each correct statement.
A. More grade 8 students were surveyed than grade 7 students.
B. A total of 221 students were surveyed.
C. Less than $50 \%$ of the grade 8 students surveyed exercised 5 or more hours last week.
D. More than $50 \%$ of the students surveyed exercised less than 5 hours last week.
E. A total of 107 grade 7 students were surveyed.

9 Mia paddled her canoe from the shore of a lake to an island. She stopped on the island to eat lunch, and then paddled her canoe back to the shore. This graph shows Mia's distance, in kilometers, from the shore over time.


Based on the graph, which of the following statements is true?
A. Mia paddled for a total of 100 minutes.
B. Mia paddled a total distance of 3 kilometers.
C. Mia paddled faster on the way to the island than on the way back to the shore.
D. Mia paddled faster on the way back to the shore than on the way to the island.

10 A chemist has two acid solutions. Solution A contains 10\% acid, and solution B contains 30\% acid. He will mix the two solutions to make 10 liters of a third solution, solution C, containing 25\% acid.

$$
\left\{\begin{array}{l}
x+y=10 \\
0.10 x+0.30 y=2.5
\end{array}\right.
$$

## Part A

Which statement about the system of equations is true?
A. In the system of equations, $x$ represents the number of liters of acid in solution $A$, and $y$ represents the number of liters of acid in solution $B$.
$B$. In the system of equations, $x$ represents the number of liters of acid in solution $B$, and $y$ represents the number of liters of acid in solution $A$.
C. In the system of equations, $x$ represents the number of liters of solution $A$ in solution $C$, and $y$ represents the number of liters of solution $B$ in solution $C$.
D. In the system of equations, $x$ represents the number of liters of solution $B$ in solution $C$, and $y$ represents the number of liters of solution $A$ in solution $C$.

## Part B

What does the expression $0.30 y$ represent?
A. the number of liters of acid in solution $C$ that come from solution $A$
$B$. the number of liters of acid in solution $C$ that come from solution $B$
C. the number of liters of solution $A$ in solution $C$
D. the number of liters of solution $B$ in solution $C$

## Part C

If the system of equations is graphed in a coordinate plane, what is the $x$-coordinate of the intersection of the two lines?

Enter your answer in the box.

## Part D

What is the number of liters of solution $B$ the chemist mixes with solution $A$ to create solution C containing 25\% acid?

Enter your answer in the box.

11 A scatterplot is shown.


Which of the following most closely approximates the line of best fit for the data in the scatterplot?
A.

B.

C.

D.


12 The figure shows line $R S$ parallel to line $U V$. The lines are intersected by 2 transversals. All lines are in the same plane.


## Part A

Explain why triangle RTS is similar to triangle VTU.
Enter your explanation in the space provided.

## Part B

Given that $m \angle S T V=108^{\circ}$, determine $m \angle S R T+m \angle T U V$.
Show your work or explain your answer.
Enter your answer and your work or explanation in the space provided.

## MASSACHUSETTS COMPREHENSIVE ASSESSMENT SYSTEM <br> Grade 8 Mathematics <br> Practice Test Answer Document

| School Name: | MARKING INSTRUCTIONS |
| :---: | :---: |
|  |  |
| District Name: | - Do not use ink, ballpoint, or felt-tip pens. |
|  | - Make solid marks that fill the circles completely. |
| Last Name of Student: | - Erase cleanly any marks you wish to change. |
|  | - Do not make any stray marks on this form. |
| First Name of Student: | - Do not fold, tear, or damage this form. |

1. (A) (B) (C) (D)
2. (A) (B) (C) (D) (E) ( $)$
3. (A) (B) (C) (D)
4. Part A (A) (B) (C) (D)

Part B (A) (B) (C) (D)
5.

6. Part A
6. Part B

6. Part C

7. (A) (B) (C) (D)
8. (A) (B) (C) (D) (E)
9. (A) (B) (C) (D)
10. Part A (A) (B) (C) (D)

Part B (A) (B) (C) (D)

Part C


Part D

11. (A) (B) (C) (D)

## 12. Part A

## 12. Part B

