## Student Name

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School Name $\qquad$
District Name/LEA








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## Grade 8

Mathematics
Performance Based Assessment Practice Test

## School Use Only


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## Unit 1

## Directions:

Today, you will be taking Unit 1 of the Grade 8 Mathematics Practice Test.
Read each question carefully. Some questions will ask you to choose one correct answer, while others will ask you to choose more than one correct answer. Mark your answers by filling in the circles in your Test Booklet for the answers you choose.
If a question asks you to show or explain your work, you must do so to receive full credit. Be sure to:

- Write your response in the box provided in your Test Booklet.
- Label each part of your work if a question has multiple parts, and clearly identify your answer for each part.
- Respond in the box provided. Crossed-out work, writing that falls outside of the box, or work on scratch paper will not be scored.
Do not make any stray marks on the Test Booklet. If you need to change an answer, be sure to erase your first answer completely.


## Calculator Directions:

In the first section of this unit, you may not use a calculator. You will not be allowed to return to the non-calculator section of the test after you have started the calculator section of the test.

If you do not know the answer to a question, skip it and go on. If you finish the non-calculator section of Unit 1 early, you may review your answers and any questions you may have skipped in the non-calculator section ONLY.
Do NOT go on to the calculator section in Unit 1 until directed to do so.

## Directions for Completing the Answer Grids

1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.

- Print only one digit or symbol in each box. You may not need all the boxes to enter an answer, but do not leave a blank box in the middle of an answer.

3. Under each box in which you wrote your answer, fill in the bubble that matches the number or symbol you wrote above.

- Fill in one and ONLY one bubble for each box. Do not fill in a bubble under an unused box.
- Fill in each bubble by making a solid mark that completely fills the circle.
- Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.

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

To answer -3 in a question, fill in the answer grid as follows:


To answer . 75 in a question, fill in the answer grid as follows:


## Mathematics <br> <br> GO ON TO NEXT PAGE

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## Unit 1 - Section 1 (Non-Calculator)

This unit has two sections: a non-calculator and a calculator section.
You will now take the first section of this unit in which you may not use a calculator. You will not be allowed to return to the non-calculator section of the test after you have started the calculator section. You will need to finish both sections within the allotted testing time.

Once you finish the non-calculator section, read the directions in your Test Booklet on how to continue.

1. Which expressions are equivalent to $\frac{1}{2^{6}}$ ?

Select all that apply.
(A) $2^{-5} \cdot 2^{-1}$
(B) $2^{-3} \cdot 2^{2}$
(C) $2^{-2} \cdot 2^{-4}$
(D) $2^{1} \cdot 2^{5}$
(E) $\quad 2^{1} \cdot 2^{6}$
(F) $\quad 2^{2} \cdot 2^{-8}$
(a) $2^{3} \cdot 2^{3}$
2. Solve this equation for $x$.

$$
0.5(5-7 x)=8-(4 x+6)
$$

Enter your answer in the box.

3. Which of these equations represent functions where $x$ is the input and $y$ is the output?

Select each correct answer.
(4) $x=2$
(B) $y=2$
(c) $y=2 x$
(0) $x=2 y$
() $x+y=2$
4. The graph represents $y$ as a function of $x$.


Which additional point can be plotted so that the graph continues to represent $y$ as a function of $x$ ?
(4) $(0,1)$
(B) $(2,2)$
© $(3,4)$
(0) $(4,2)$
5.


Seven line segments are shown on the coordinate plane.
Which of these segments could be the image of segment $A B$ after a sequence of reflections, rotations, and/or translations?

Select each correct answer.
(®) line segment $C D$
(B) line segment $E F$
© line segment GH
(0) line segment $J K$
© line segment $L M$
© line segment $N P$

Use the information provided to answer Part A and Part B for question 6.

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).

## 6. Part A

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

## Part B

What are the signs of the coordinates $(x, y)$ of point $Q^{\prime \prime}$ ?
(4) Both $x$ and $y$ are positive.
(B) $x$ is negative and $y$ is positive.
© Both $x$ and $y$ are negative.
(D) $x$ is positive and $y$ is negative.
7. Lines $m$ and $n$ are parallel on a coordinate plane. Lines $m$ and $n$ are transformed by the same rotation, resulting in image lines $s$ and $t$. Which statement describes the relationship between lines $s$ and $t$ ?

Lines $s$ and $t$ are parallel.
(B) Lines $s$ and $t$ are perpendicular.
© Lines $s$ and $t$ are intersecting but not perpendicular.
(D) The relationship between lines $s$ and $t$ cannot be determined without knowing the angle of the rotation.
8. One type of ant weighs about $3 \times 10^{-3}$ gram. The ant can carry close to $1.5 \times 10^{-1}$ gram of food on its back. The amount of food, in grams, an ant can carry on its back is approximately how many times its own body weight, in grams? Give your answer in standard form.

Enter your answer in the box.

9. Consider the system of equations.

$$
\left\{\begin{array}{l}
y=2 x+2 \\
y=6 x+2
\end{array}\right.
$$

Which statements are true about the system of equations?
Select each correct answer.
(A) The graph of the system consists of lines that have no points of intersection.
(B) The graph of the system consists of lines that have exactly one point of intersection.
© The graph of the system consists of lines that have more than one point of intersection.
(D) The system has no solution.
() The system has exactly one solution.
© The system has more than one solution.


You have come to the end of the non-calculator section in Unit 1 of the test.

- If you have time, review your answers in the non-calculator section ONLY. You will not be allowed to return to the non-calculator section once you have received your calculator.
- Then, raise your hand to receive your calculator before going on to the calculator section.


## Unit 1 - Section 2 (Calculator)

Once you have received your calculator, continue with the calculator section.
10. The average distance from Earth to the Moon is approximately 384,400,000 meters. What is the average distance, in kilometers, from Earth to the Moon written in scientific notation?
(A) $3.844 \times 10^{4}$ kilometers
(B) $3.844 \times 10^{5}$ kilometers
(C) $3.844 \times 10^{7}$ kilometers
(D) $3.844 \times 10^{8}$ kilometers
11. Larry and Mark each mow lawns in their neighborhoods. Information about each person's earnings is shown.


## Mark's Earnings

- Mark earns $\$ 60$ for mowing 3 lawns.
- Mark earns $\$ 300$ for mowing 15 lawns.

For both Larry and Mark, the number of dollars earned is proportional to the number of lawns mowed.

Which statement correctly compares the amount of money Larry and Mark each earn per lawn?
(A) Larry earns $\$ 2$ more than Mark earns per lawn.
(B) Larry earns $\$ 5$ less than Mark earns per lawn.
© Larry earns $\$ 10$ more than Mark earns per lawn.
(0) Larry earns $\$ 15$ less than Mark earns per lawn.

Use the information provided to answer Part A and Part B for question 12.

In a system of two linear equations, the lines represented by each equation have the same slope.

## 12. Part A

Which could be the total number of solutions to the system of equations?
Select each correct answer.
(4) no solutions
(B) 1 solution
© 2 solutions
(0) 3 solutions
(®) infinitely many solutions

## Part B

Explain why you chose your answer(s) in Part A.
Enter your explanation for each selection in the space provided.
13. Two utility companies sell electricity in units of kilowatt-hours. The cost of electricity for company P is shown in the table. The cost of electricity for company M can be found by using the equation shown, where $y$ represents the total cost in dollars for $x$ kilowatt-hours of electricity.

| Electrici |  |
| :---: | :---: |
| Company P |  |
| Number of <br> Kilowatt-hours | Total Cost <br> (dollars) |
| 1,250 | 150.00 |
| 1,650 | 198.00 |

- Use the information provided to find the unit rate, in dollars per kilowatt-hour, for each company. Show your work or explain your answers.
- Find the total cost, in dollars, of buying 2,375 kilowatt-hours of electricity from the least expensive company.

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

Use the information provided to answer Part A and Part B for question 14.

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.


## 14. Part A

Explain why triangle $R T S$ 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.

Use the information provided to answer Part A and Part B for question 15.

In the coordinate plane shown, triangle $A B C$ is congruent to triangle $A^{\prime} B^{\prime} C^{\prime}$.
Triangle $A^{\prime} B^{\prime} C^{\prime}$ is similar to triangle $A^{\prime \prime} B^{\prime \prime} C^{\prime \prime}$.

15. Part A

Describe a single transformation that shows that triangle $A^{\prime} B^{\prime} C^{\prime}$ is congruent to triangle $A B C$. Include all the necessary information to complete the transformation.

Enter your description in the space provided.

## Part B

Describe a sequence of transformations that shows that triangle $A^{\prime \prime} B^{\prime \prime} C^{\prime \prime}$ is similar to triangle $A^{\prime} B^{\prime} C^{\prime}$. Include all the necessary information to complete each transformation.

Enter your description in the space provided.

Use the information provided to answer Part A and Part B for question 16.

The owner of a computer store is offering a discount on a computer sold in the store.

## Computer Sale!

Original Price: \$598.00 $25 \%$ off original price

8\% tax applied after discount

## 16. Part A

The owner offers a payment plan where the total cost of the computer is paid in 6 equal monthly payments.

- Determine the amount of each monthly payment.
- Show your work or explain your answer.

Enter the monthly payment and your work or explanation in the space provided.

## Part B

A different computer is advertised as 40\% off of the original price. After the discount, the tax is \$44.64.

- Determine the total price of this computer after the discount and tax are applied.
- Show your work or explain your answer.
- Determine the original price of this computer.
- Show your work or explain your answer.

Enter your answers and your work or explanations in the space provided.

Use the information provided to answer Part A through Part C for question 17.

Martin is considering the expressions $\frac{1}{2}(7 x+48)$ and $-\left(\frac{1}{2} x-3\right)+4(x+5)$. He wants to know if one expression is greater than the other for all values of $x$.

## 17. Part A

Which statement about the relationship between the expressions is true?
(4) The value of the expression $\frac{1}{2}(7 x+48)$ is always equal to the value of the expression $-\left(\frac{1}{2} x-3\right)+4(x+5)$.
(8) The value of the expression $\frac{1}{2}(7 x+48)$ is always less than the value of the expression $-\left(\frac{1}{2} x-3\right)+4(x+5)$.
© The value of the expression $\frac{1}{2}(7 x+48)$ is always greater than the value of the expression $-\left(\frac{1}{2} x-3\right)+4(x+5)$.
(0) The value of the expression $\frac{1}{2}(7 x+48)$ is sometimes greater than and sometimes less than the value of the expression $-\left(\frac{1}{2} x-3\right)+4(x+5)$.

## Part B

Show or explain how you found your answer to Part A.
Enter your work or your explanation in the space provided.

## Part C

Write a new expression that always has a greater value than both of these expressions.

Enter your expression in the space provided.
18. The gasoline mileage for two cars can be compared by finding the distance each car traveled and the amount of gasoline used. The table shows the distance that car M traveled using $x$ gallons of gasoline. The graph shows the distance, $y$, that car $P$ traveled using $x$ gallons of gasoline.

Car M

| Amount of <br> Gasoline <br> (gallons) | Distance <br> (miles) |
| :---: | :---: |
| 2 | 50.4 |
| 3 | 80.5 |
| 7 | 181.3 |
| 5 | 137.5 |




You have come to the end of the calculator section in Unit 1 of the test.

- Review your answers in the calculator section of Unit 1 only.
- Then, close your test booklet and raise your hand to turn in your test materials.

