Student Name _____

P

Grade 8 Mathematics Test Booklet

Practice Test

TEST BOOKLET SECURITY BARCODE

Unit 1
(Non-Calculator)

Directions:

Today, you will take Unit 1 of the Grade 8 Mathematics Practice Test. You will not be able to use a calculator.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the provided space will be scored.

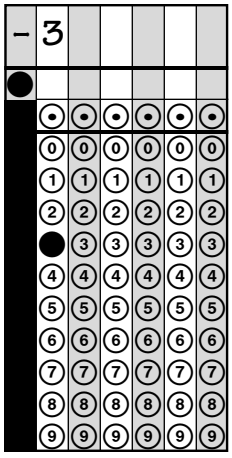
If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this unit ONLY. Do not go past the stop sign.

Directions for Completing the Answer Grids

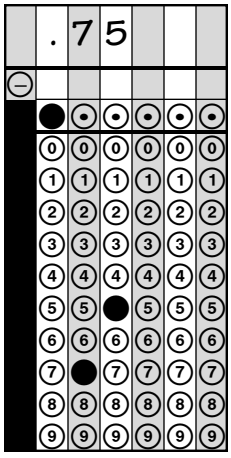
1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid 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. 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. Which of these equations represent functions where x is the input and y is the output?

Select **each** correct answer.

A. $x = 2$

B. $y = 2$

C. $y = 2x$

D. $x = 2y$

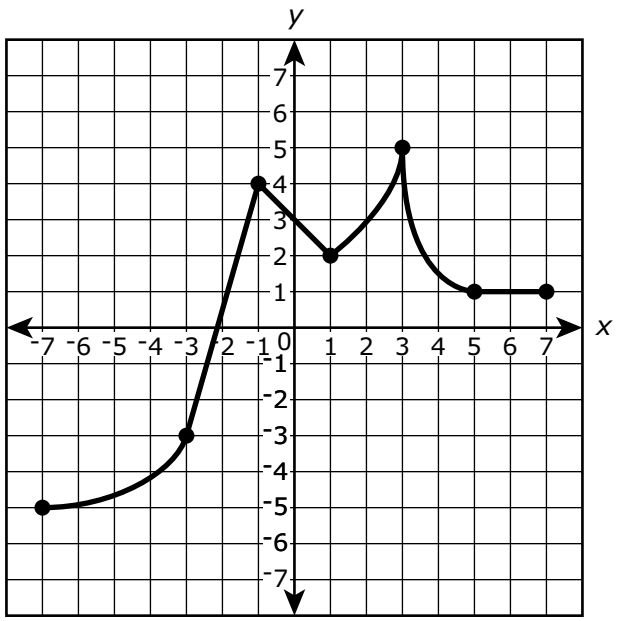
E. $x + y = 2$

2. Solve this equation for x.

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

Enter your answer in the box.

3. The graph shows y as a function of x.



For which intervals is the function decreasing?

Select **all** that apply.

A. $-7 < x < -3$

B. $-3 < x < -1$

C. $-1 < x < 1$

D. $1 < x < 3$

E. $3 < x < 5$

F. $5 < x < 7$

4. 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.

5. Which equation has **both** 4 and -4 as possible values of y?

A. $y^2 = 8$

B. $y^3 = 8$

C. $y^2 = 16$

D. $y^3 = 64$

6. A system of equations is shown.

$$\begin{cases} x = 10 \\ 3x + 5y = 20 \end{cases}$$

In the system of equations, what is the value of y?

Enter your answer in the box.

7. Which equations define y as a nonlinear function of x?

Select **all** that apply.

A. $y = 7.4x$

B. $y = 2x + 5^2$

C. $y = 10x^2$

D. $y = 5x - 3$

E. $y = \frac{x}{2}$

F. $y = 2x^3 + 1$

8. Consider the system of equations.

$$\begin{cases} y = 2x + 2 \\ y = 6x + 2 \end{cases}$$

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.

C. The graph of the system consists of lines that have more than one point of intersection.

D. The system has no solution.

E. The system has exactly one solution.

F. The system has more than one solution.

9. Which decimal is the equivalent of $\frac{6}{11}$?

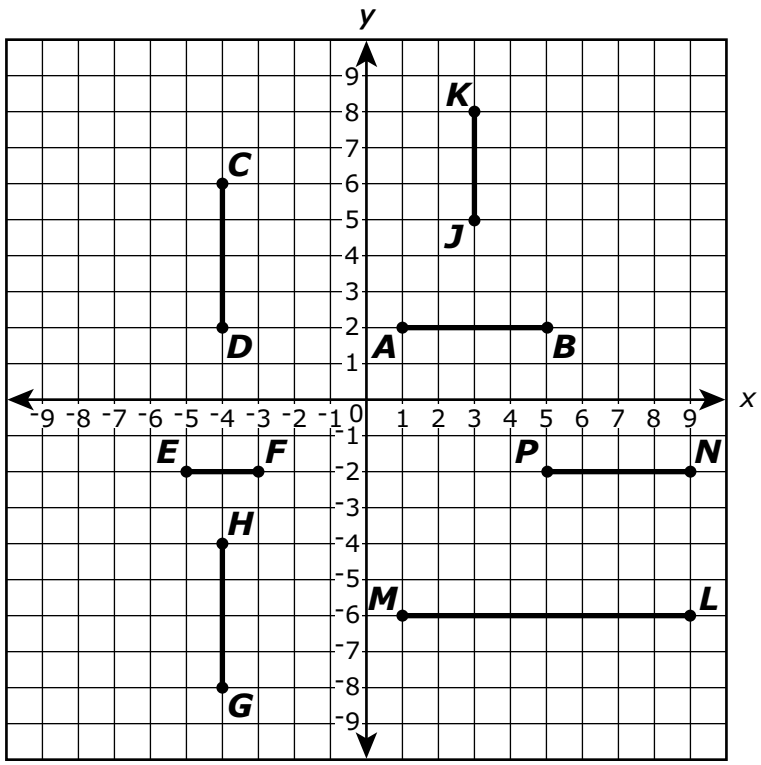
A. $0.18\overline{3}$

B. $0.1\overline{83}$

C. $0.5\overline{4}$

D. $0.\overline{54}$

10.



Seven line segments are shown on the coordinate plane.

Which of these segments could be the image of segment AB after a sequence of reflections, rotations, and/or translations?

Select **each** correct answer.

A. line segment CD

B. line segment EF

C. line segment GH

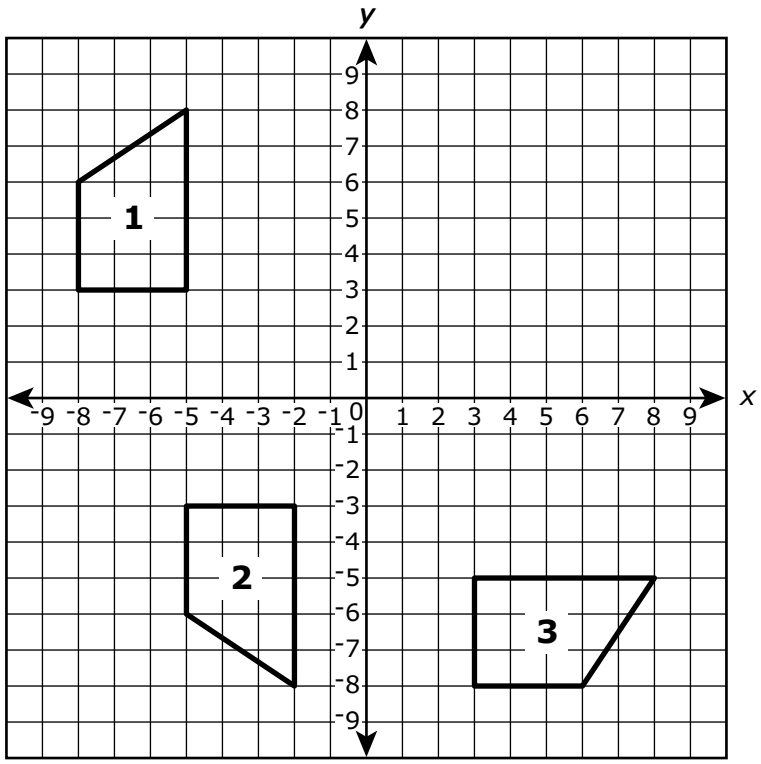
D. line segment JK

E. line segment LM

F. line segment NP

Use the information provided to answer Part A and Part B for question 11.

Three congruent figures are shown in the coordinate plane.



11. Part A

Which statement describes a possible sequence of transformations that transforms figure 1 into figure 2?

A. a reflection across the *x*-axis, followed by a translation 2 units to the left

B. a reflection across the *x*-axis, followed by a translation 3 units to the right

C. a rotation 180° clockwise about the origin, followed by a translation 2 units to the left

D. a rotation 180° clockwise about the origin, followed by a translation 3 units to the right

Part B

Figure 3 can also be created by transforming figure 1 with a sequence of two transformations.

Which statement describes a possible sequence of transformations that transforms figure 1 into figure 3?

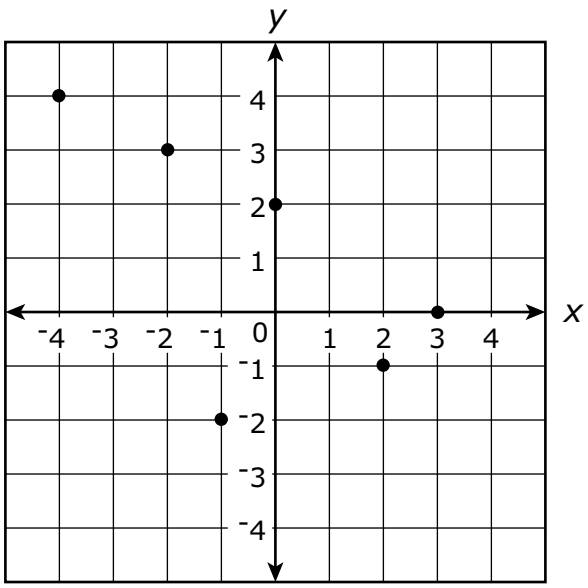
A. a rotation 180° clockwise about the origin, followed by a translation 2 units to the left

B. a rotation 90° clockwise about the origin, followed by a reflection across the *x*-axis

C. a rotation 180° clockwise about the origin, followed by a reflection across the *y*-axis

D. a rotation 90° clockwise about the origin, followed by a translation 3 units to the right

12. 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?

A. $(0, 1)$

B. $(2, 2)$

C. $(3, 4)$

D. $(4, 2)$

13. Which expressions are equivalent to $\frac{3^{-8}}{3^{-4}}$?

Select **all** that apply.

A. 3^{-12}

B. 3^{-4}

C. 3^{2}

D. $\frac{1}{3^{2}}$

E. $\frac{1}{3^{4}}$

F. $\frac{1}{3^{12}}$

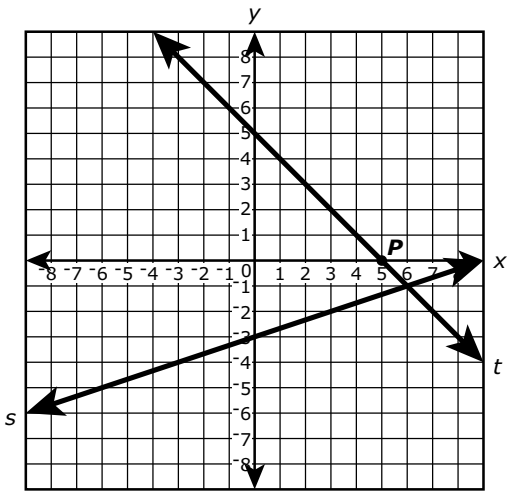
14. The equation of line s is $y = \frac{1}{3}x - 3$.

The equation of line t is $y = -x + 5$.

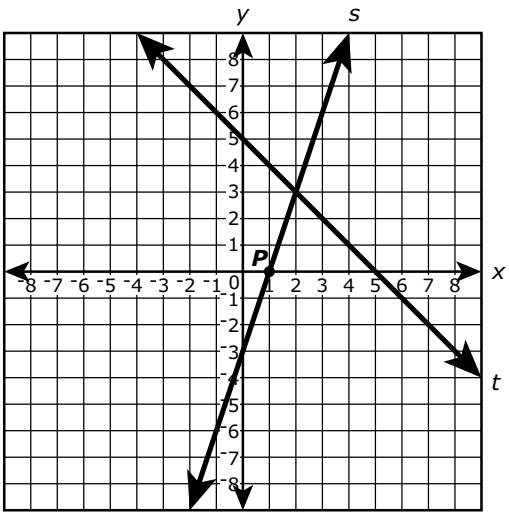
The equations of lines s and t form a system of equations. The solution to the system of equations is located at point P.

Which graph correctly shows line s, line t, and point P?

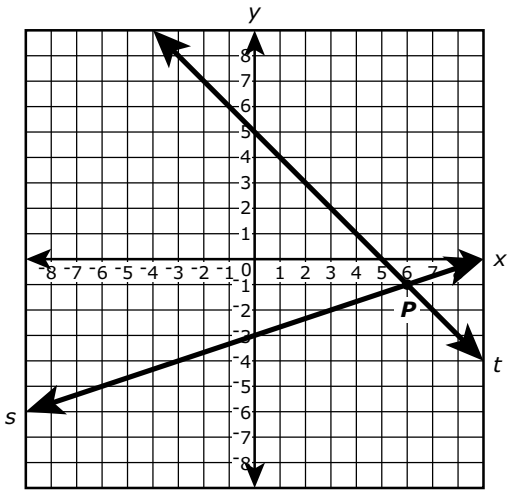
A.



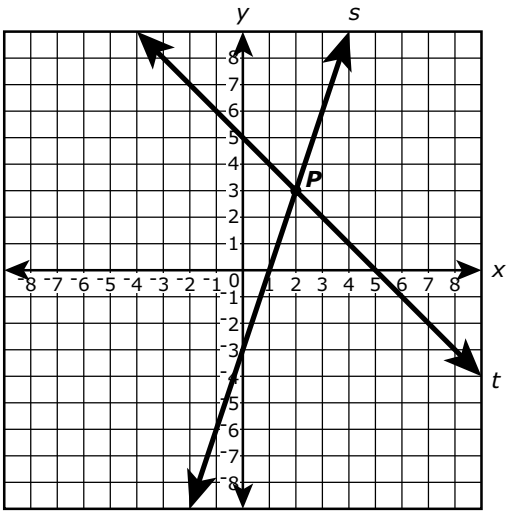
B.



C.

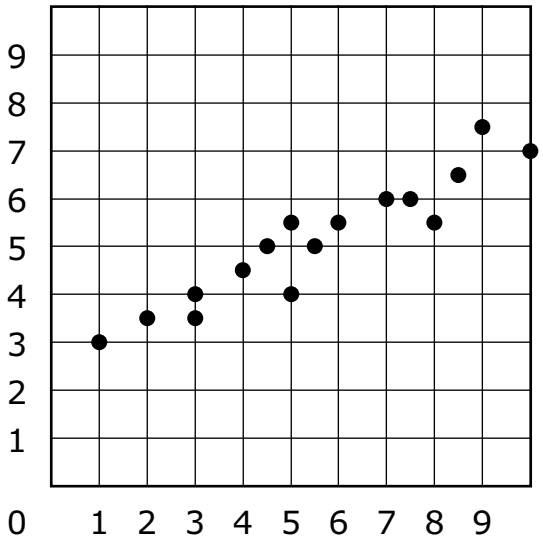


D.



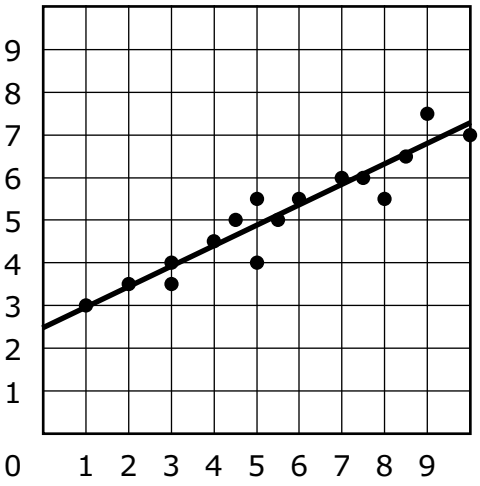
GO ON TO NEXT PAGE

15. A scatter plot is shown on the coordinate plane.

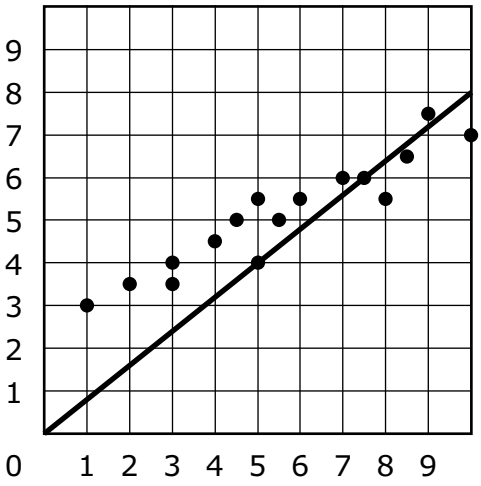


Which of these **most closely** approximates a line of best fit for the data in the scatter plot?

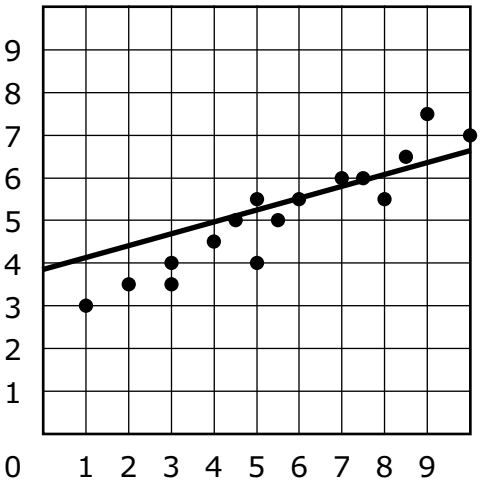
A.



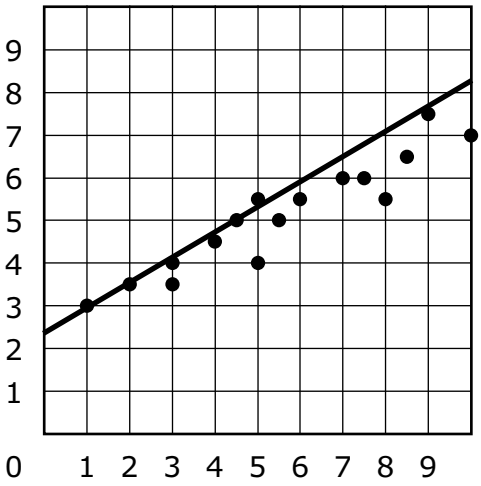
B.



C.



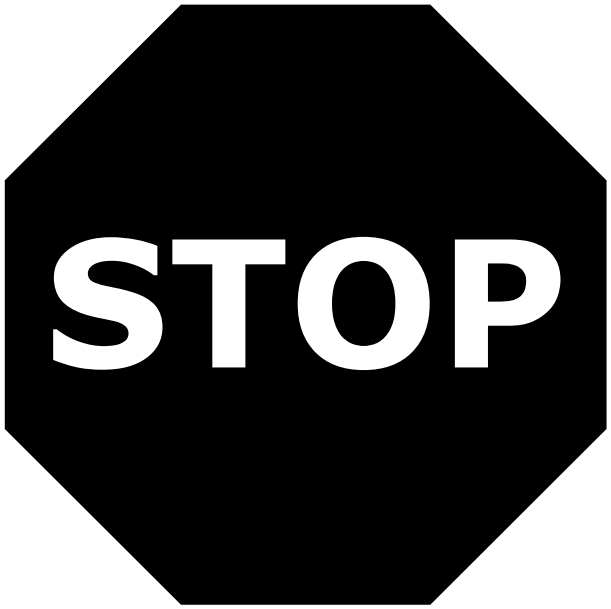
D.



16. The body of a 154-pound person contains approximately 2×10^{-1} milligrams of gold and 6×10^{1} milligrams of aluminum. Based on this information, the number of milligrams of aluminum in the body is how many times the number of milligrams of gold in the body?

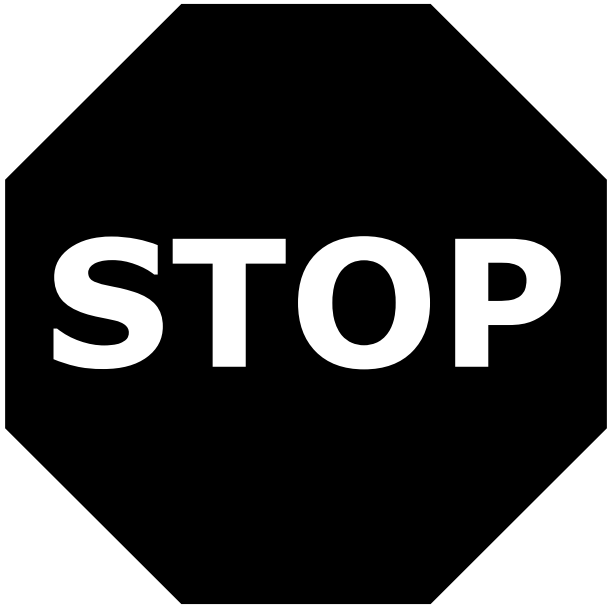
Enter your answer in the box.

STOP



You have come to the end of Unit 1 of the test.

- **Review your answers from Unit 1 only.**
- **Then, close your test booklet and answer document and raise your hand to turn in your test materials.**


STOP

Unit 2
(Calculator)

Directions:

Today, you will take Unit 2 of the Grade 8 Mathematics Practice Test. You will be able to use a calculator.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the provided space will be scored.

If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this unit ONLY. Do not go past the stop sign.

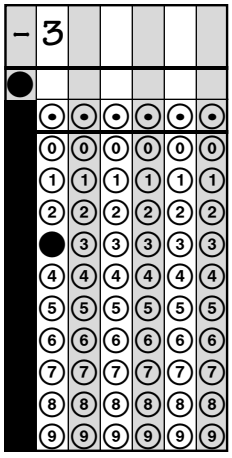
GO ON ▶

Directions for Completing the Answer Grids

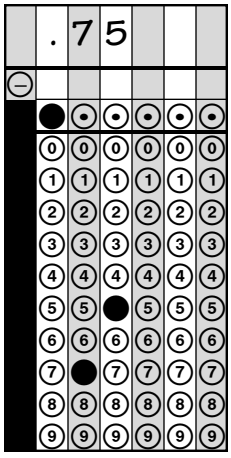
1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid 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. 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.



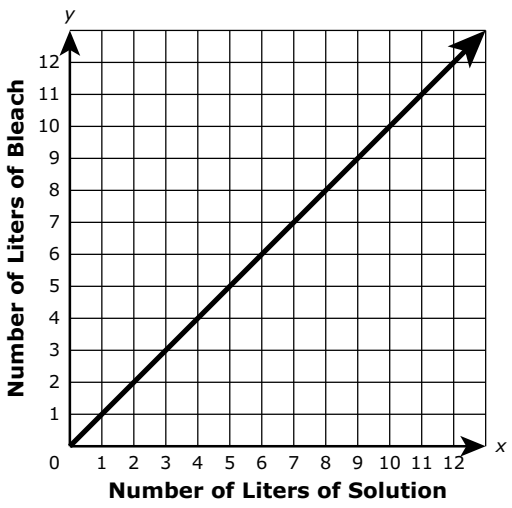
To answer .75 in a question, fill in the answer grid as shown below.



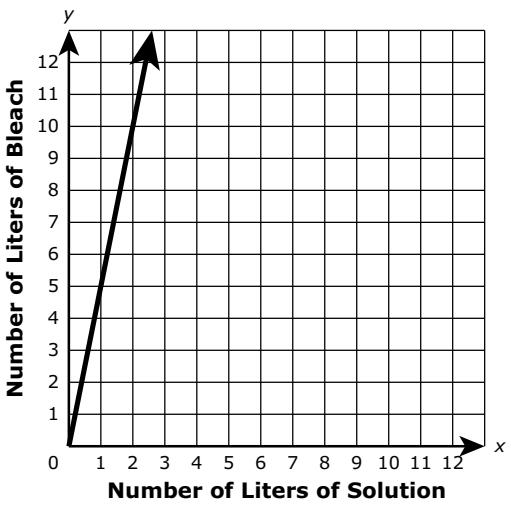
17. A solution is 20% bleach.

Which graph represents the number of liters of bleach, y, contained in x liters of solution?

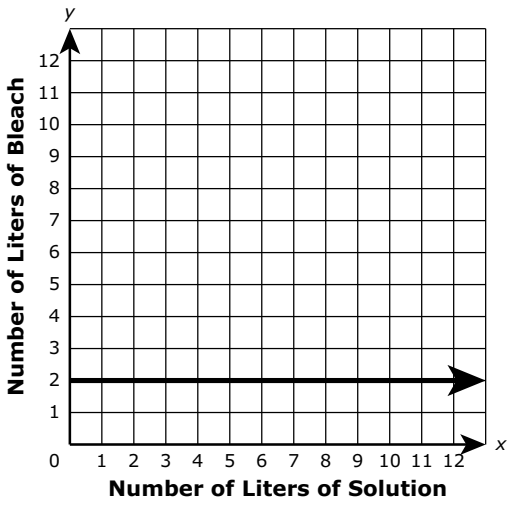
A.



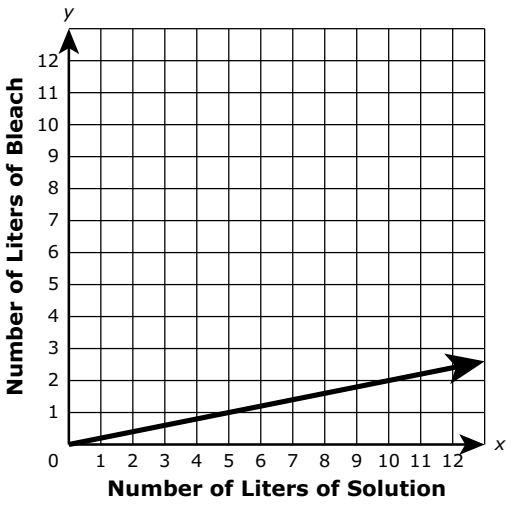
B.



C.



D.



GO ON ▶

Use the information provided to answer Part A and Part B for question 18.

Filipo is building a rectangular sandbox for his younger brother. The length of the sandbox is 1 foot longer than twice the width of the sandbox. The perimeter of the sandbox is 29 feet.

18. Part A

Which equation could be used to determine w, the width, in feet, of the sandbox?

A. $w + w + 2 = 29$

B. $w + 2w + 1 = 29$

C. $2w + 2(w + 2) = 29$

D. $2w + 2(2w + 1) = 29$

Part B

What is the width, in feet, of the sandbox?

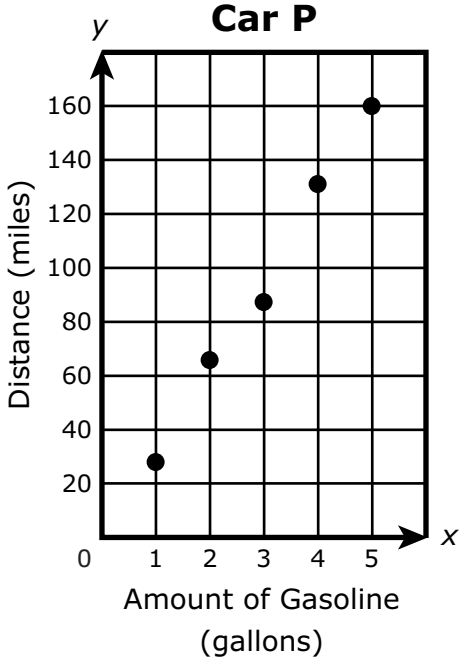
Enter your answer in the box.

19. 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 Gasoline (gallons)	Distance (miles)
2	50.4
3	80.5
7	181.3
5	137.5

Car P

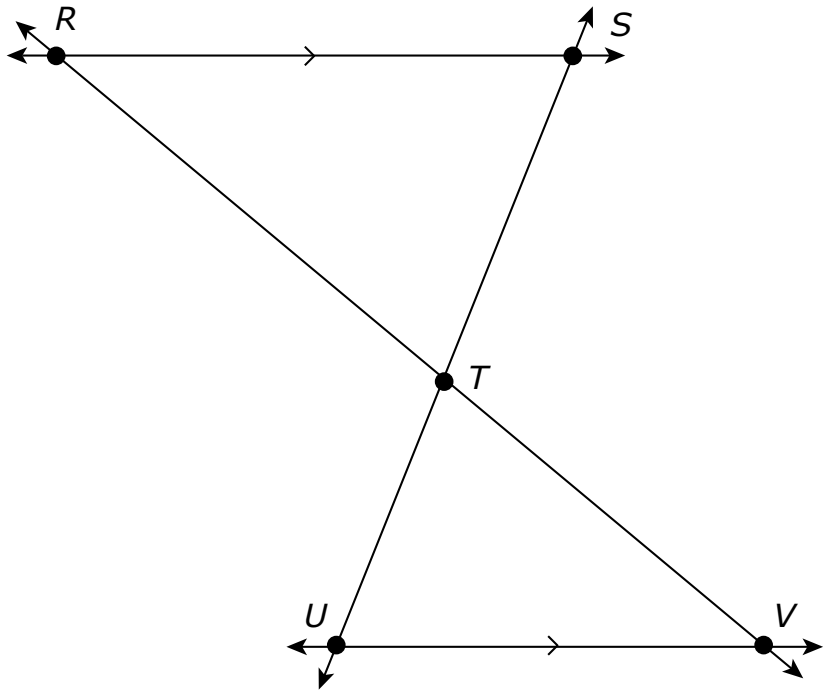


Based on the information in the table and the graph, compare the approximate miles per gallon of car M to car P. Show your work or explain your answer.

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 20.

The figure shows line *RS* parallel to line *UV*. The lines are intersected by 2 transversals. All lines are in the same plane.



20. Part A

Explain why triangle *RTS* is similar to triangle *VTU*.

Enter your explanation in the space provided.

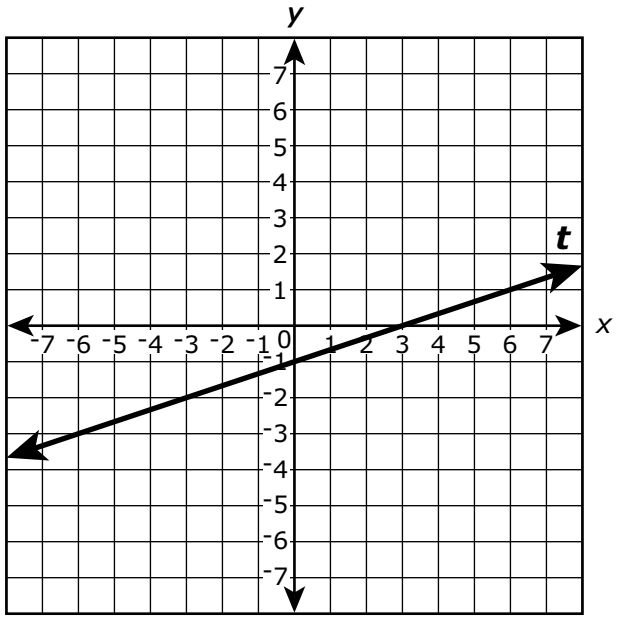
Part B

Given that $m\angle STV = 108°$, determine $m\angle SRT + m\angle TUV$. 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 through Part D for question 21.

Line *t* is shown in the coordinate plane.



21. Part A

What is the slope of line *t*?

A. 3

B. $\frac{1}{3}$

C. $-\frac{1}{3}$

D. −3

Part B

What is the *y*-intercept of line *t*?

A. -1

B. $-\frac{1}{3}$

C. $\frac{1}{3}$

D. 3

Part C

Line *s* (not shown) has the same slope and passes through the point (0, 4). Which table represents 4 points on line *s*?

A.

x	*y*
−6	2
−3	3
0	4
3	5

B.

x	*y*
−6	−14
−3	−5
0	4
3	13

C.

x	*y*
−6	6
−3	5
0	4
3	3

D.

x	*y*
−6	22
−3	13
0	4
3	−5

GO ON ▶

Part D

Which equation could represent line *s*?

A. $y = -\frac{1}{3}x + 4$

B. $y = -3x + 4$

C. $y = 3x + 4$

D. $y = \frac{1}{3}x + 4$

Use the information provided to answer Part A through Part C for question 22.

Martin is considering the expressions $\frac{1}{2}(7x + 48)$ 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.

22. Part A

Which statement about the relationship between the expressions is true?

A. The value of the expression $\frac{1}{2}(7x + 48)$ is always equal to the value of the expression $-\left(\frac{1}{2}x - 3\right) + 4(x + 5)$.

B. The value of the expression $\frac{1}{2}(7x + 48)$ is always less than the value of the expression $-\left(\frac{1}{2}x - 3\right) + 4(x + 5)$.

C. The value of the expression $\frac{1}{2}(7x + 48)$ is always greater than the value of the expression $-\left(\frac{1}{2}x - 3\right) + 4(x + 5)$.

D. The value of the expression $\frac{1}{2}(7x + 48)$ 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.

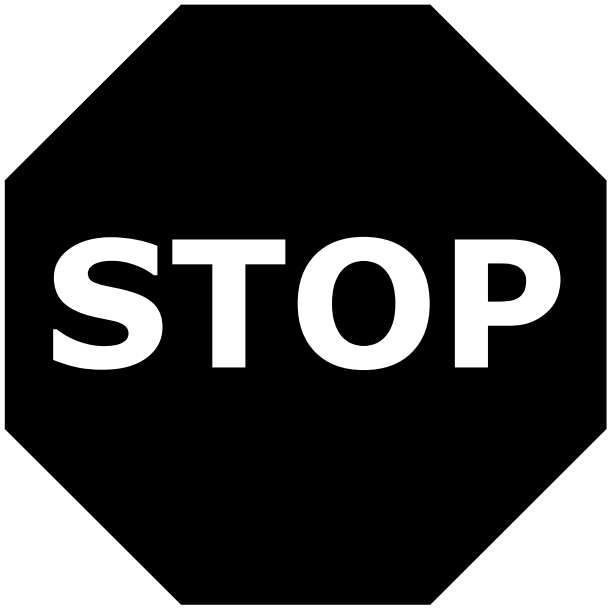
Enter your work or your explanation in the space provided.

Part C

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

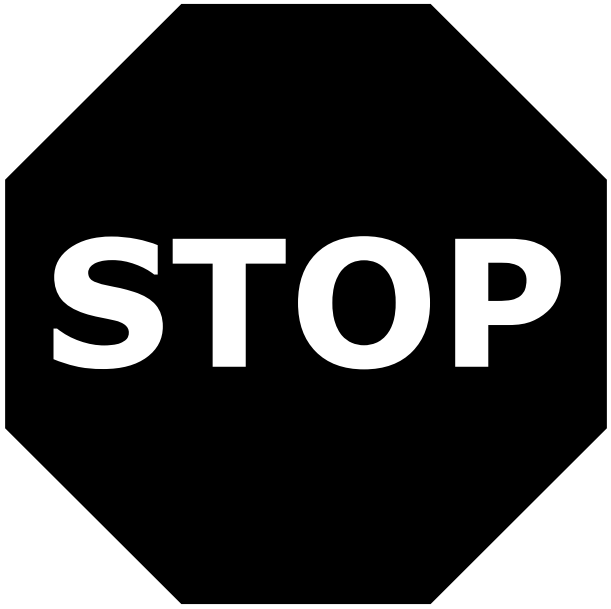
Enter your expression in the space provided.

STOP



You have come to the end of Unit 2 of the test.

- **Review your answers from Unit 2 only.**
- **Then, close your test booklet and answer document and raise your hand to turn in your test materials.**


STOP

Unit 3
(Calculator)

Directions:

Today, you will take Unit 3 of the Grade 8 Mathematics Practice Test. You will be able to use a calculator.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the provided space will be scored.

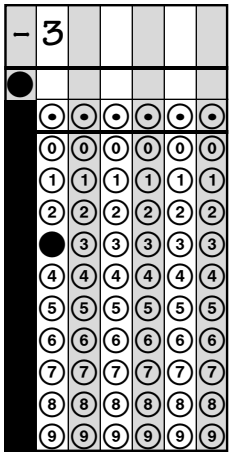
If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this unit ONLY. Do not go past the stop sign.

Directions for Completing the Answer Grids

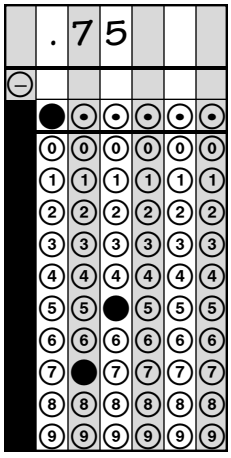
1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid 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. 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.

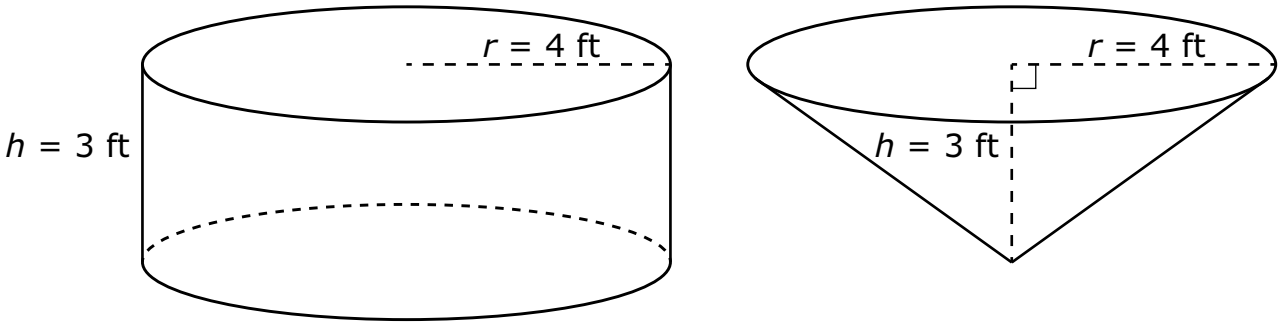


To answer .75 in a question, fill in the answer grid as shown below.



Use the information provided to answer Part A and Part B for question 23.

The figure shows a right-circular cylinder and a right-circular cone. The cylinder and the cone have the same base and the same height.



23. Part A

What is the volume, in cubic feet, of the cone?

A. 12π

B. 16π

C. 36π

D. 48π

Part B

What is the ratio of the cone's volume to the cylinder's volume?

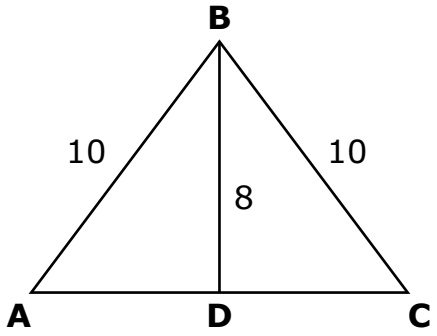
A. $\frac{1}{1}$

B. $\frac{1}{2}$

C. $\frac{1}{3}$

D. $\frac{1}{4}$

24. In $\triangle ABC$, $\overline{BD}$ is perpendicular to $\overline{AC}$. The dimensions are shown in centimeters.



What is the length, in centimeters, of $\overline{AC}$?

Enter your answer in the box.

25. Relationship A is defined by the equation $y = 9x$.

Some values of relationship B are shown in the table.

Relationship B

x	y
0	0
3	34.5
5	57.5
8	92

Both relationships represent a direct proportion between x and y. The rate of change of relationship B is how many units greater than the rate of change of relationship A?

A. 1.5

B. 2.5

C. 25.5

D. 43.5

26. 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.

Electricity Costs

Company P

Number of Kilowatt-hours	Total Cost (dollars)
1,250	150.00
1,650	198.00

Company M

$y = 0.15x$

- 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 27.

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

27. Part A

Which could be the total number of solutions to the system of equations?

Select **each** correct answer.

A. no solutions

B. 1 solution

C. 2 solutions

D. 3 solutions

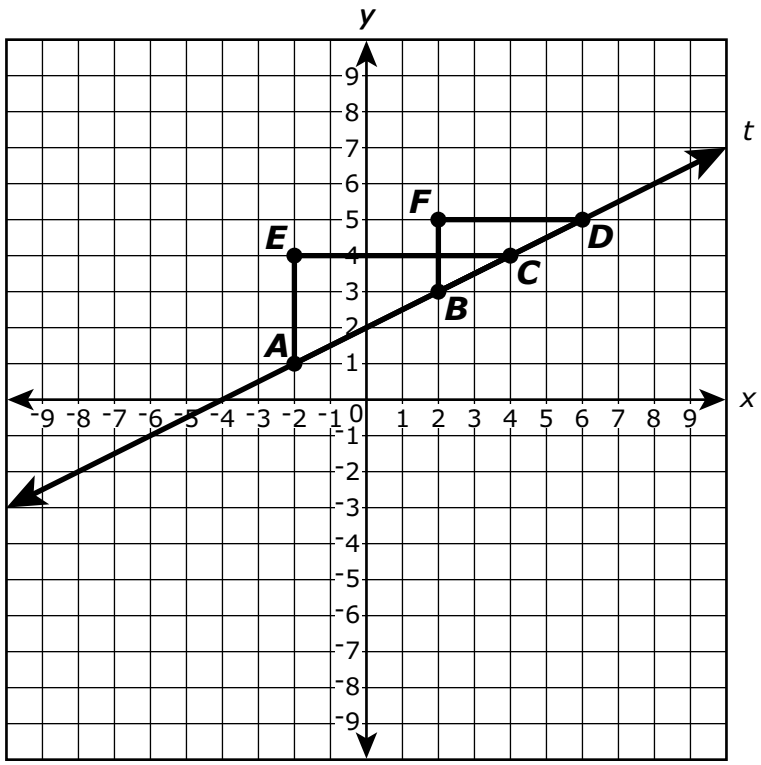
E. infinitely many solutions

Part B

Explain why you chose your answer(s) in Part A.

Enter your explanation for each selection in the space provided.

28. Line t and $\triangle ECA$ and $\triangle FDB$ are shown on the coordinate plane.



Which statements are true?

Select **all** that apply.

A. The slope of $\overline{AC}$ is equal to the slope of $\overline{BC}$.

B. The slope of $\overline{AC}$ is equal to the slope of $\overline{BD}$.

C. The slope of $\overline{AC}$ is equal to the slope of line t.

D. The slope of line t is equal to $\frac{EC}{AE}$.

E. The slope of line t is equal to $\frac{FB}{FD}$.

F. The slope of line t is equal to $\frac{AE}{FD}$.

GO ON ▶

Use the information provided to answer Part A and Part B for question 29.

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

29. 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.

30. Function A is a linear function. Some values of Function A are shown in the table.

Function A

x	y
−1	−5
3	3
5	7
6	9

Function B is a linear function with a y-intercept of 3 and an x-intercept of -5.

Which statement is true?

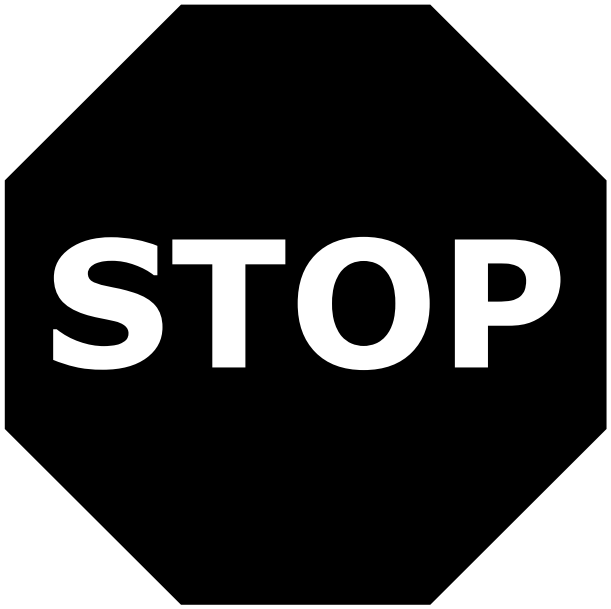
A. The slope of Function A is greater than the slope of Function B, and the y-intercept of Function A is greater than the y-intercept of Function B.

B. The slope of Function A is less than the slope of Function B, and the y-intercept of Function A is greater than the y-intercept of Function B.

C. The slope of Function A is greater than the slope of Function B, and the y-intercept of Function A is less than the y-intercept of Function B.

D. The slope of Function A is less than the slope of Function B, and the y-intercept of Function A is less than the y-intercept of Function B.

STOP



You have come to the end of Unit 3 of the test.

- **Review your answers from Unit 3 only.**
- **Then, close your test booklet and answer document and raise your hand to turn in your test materials.**

P

8 - MTH

MATH08ABO

1117043 1 2 3 4 5 A B C D E Printed in the USA ISD20031