



THIRD SPACE  
LEARNING

# 8th Grade New Jersey State Practice Math Test

New Jersey Practice Test Grade  
8

Grade 8

## Questions

Name: .....

Class: .....

Date: .....

Score: .....

16 questions

You are not permitted to use a calculator.

1 Which numbers are irrational? Select all the correct answers.

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

B.  $4\pi$

C.  $\sqrt{5^2}$

D.  $\sqrt{12}$

E.  $\sqrt[3]{27}$

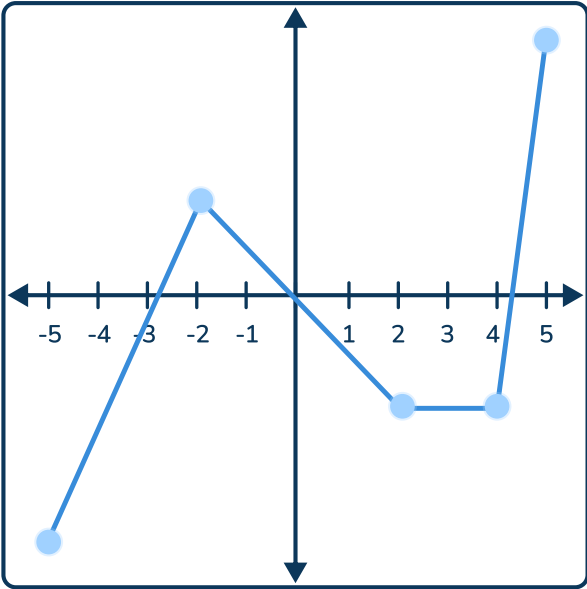
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2 Solve the equation for  $p$ . Place your answer in the space provided.

$$\sqrt[3]{p} = 8$$

Value of  $p$

- 3
- The graph below shows  $y$  as a function of  $x$ . For each interval in the table, indicate whether the function is increasing, decreasing, or neither increasing nor decreasing over the interval.



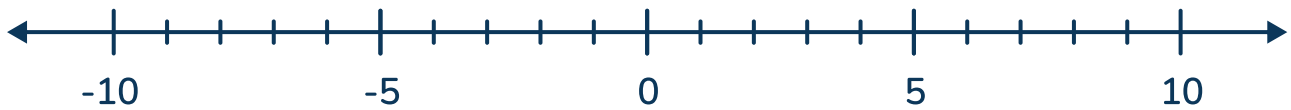
In the table, check off the correct box.

Interval	Increasing	Decreasing	Neither increasing nor decreasing
$-5 < x < -2$			
$-2 < x < 2$			
$2 < x < 4$			

- 4
- Which equation represents the graph of a line on the coordinate plane that has an  $x$ -intercept of  $(2, 0)$  and a  $y$ -intercept of  $(0, 8)$ ?

- A.  $y = 4x - 8$
- B.  $y = -4x + 8$
- C.  $y = -\frac{1}{4}x + 8$
- D.  $y = \frac{1}{4}x - 8$

- 5 Place a point on the number line that is the best approximation of  $\sqrt{10}$ ?



- 6 Which expressions have a value of  $\frac{1}{64}$ ? Select all that apply.

- A.  $\frac{2^2}{2^8}$
- B.  $(2^3)^{-2}$
- C.  $2^{-8} + 2^2$
- D.  $(2^5)^{-1}$
- E.  $2^8 \times 2^{-2}$

- 7 Find the solution to the system of equations.

$$x = 8$$

$$2x + 4y = -8$$

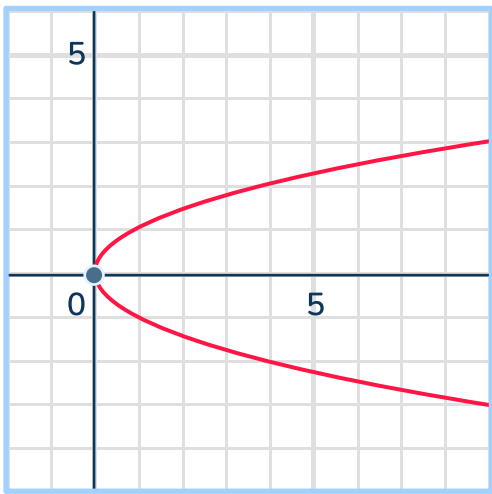
Enter your answer in the spaces below.

( \_\_\_\_\_ , \_\_\_\_\_ )

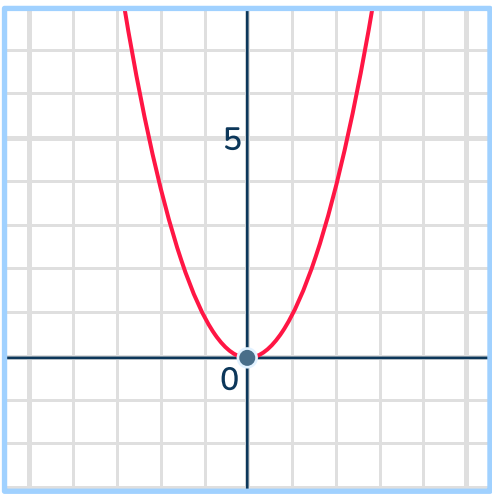


8 Which graph shows  $y$  to be a function of  $s$ ?

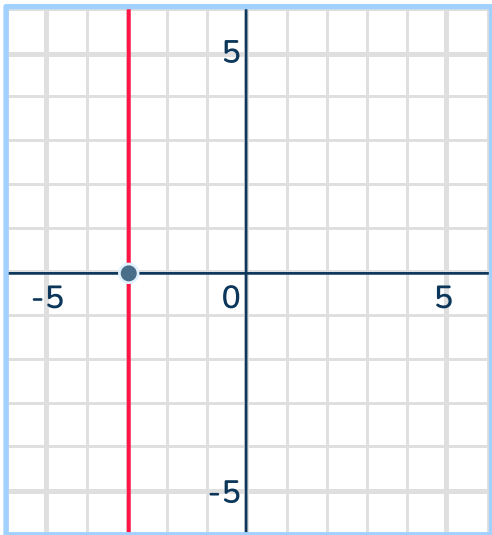
A.



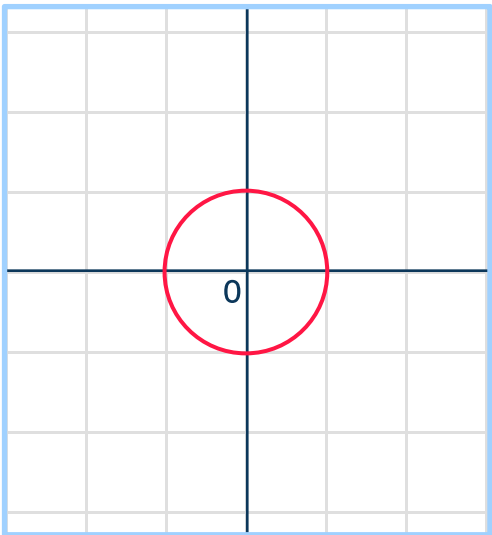
B.



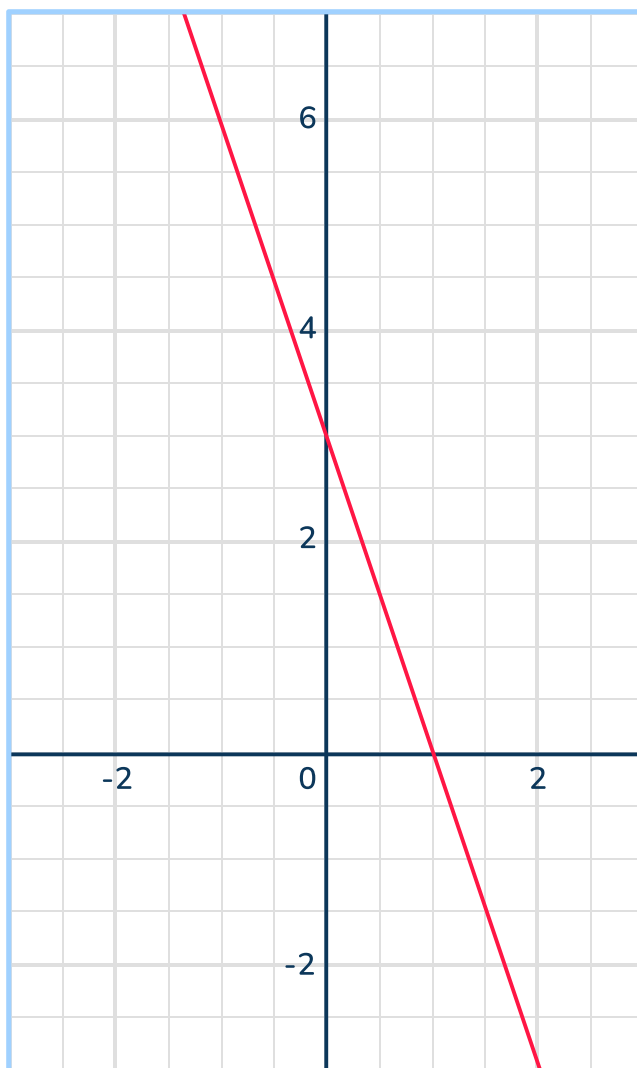
C.



D.



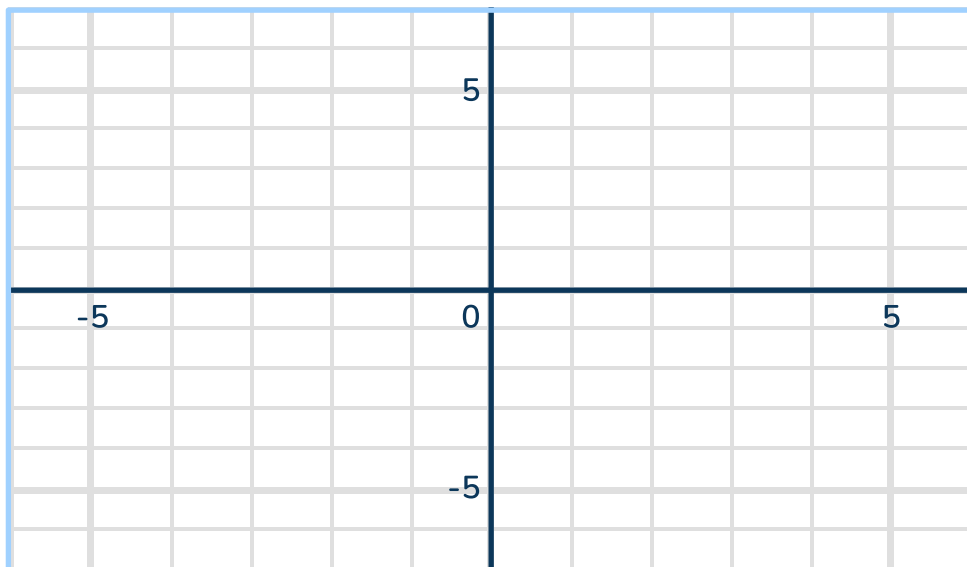
- 9 Write the equation of the line in  $y = mx + b$  form that is represented by the graph below.



Place your answer in the space below.

Equation of the line.

- 10  $\triangle TGS$  with vertices  $T(0, 1)$ ,  $G(-2, 3)$ , and  $S(-4, -1)$  will be rotated  $180^\circ$  about the origin. What will be the coordinates of  $S'$ ?



Write your answer in the space below.

( \_\_\_\_\_ , \_\_\_\_\_ )

- 11 The table and the equation both show a different relationship between  $y$  and  $x$ .

Function A

$x$	$y$
2	-14
3	-11
5	-5

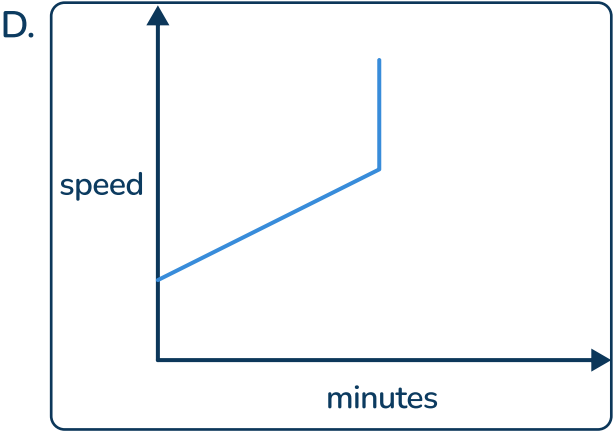
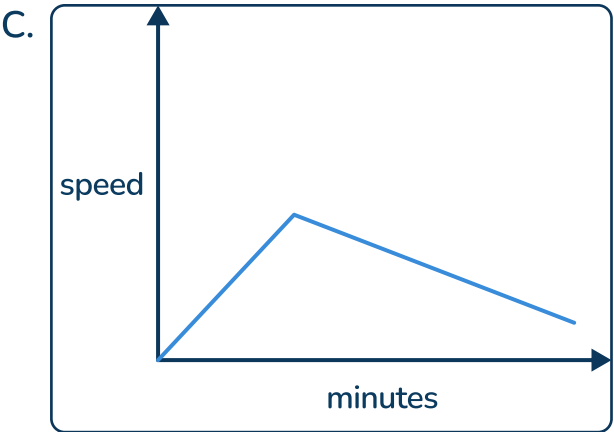
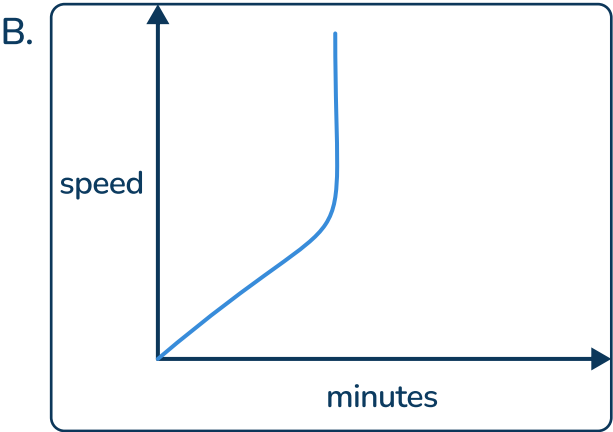
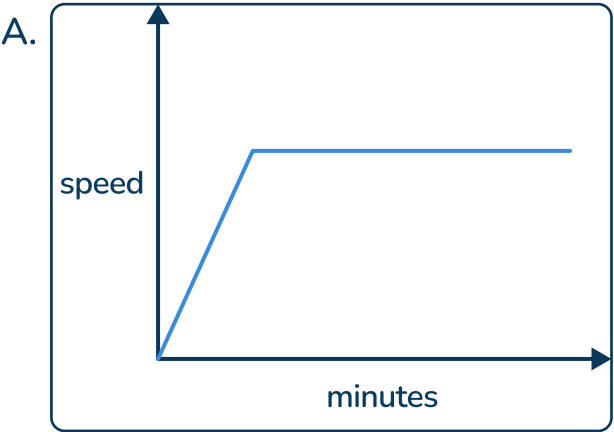
Function B

$$y = 2x + 3$$

Which statement about the functions is true?

- A. The rate of change of Function A is less than the rate of change of Function B because  $-3 < 2$ .
- B. The rate of change of Function A is greater than the rate of change of Function B because  $3 > 2$ .
- C. The rate of change of Function A is less than the rate of change of Function B because  $-14 < 7$ .
- D. The rate of change of Function A is greater than the rate of change of Function B because  $-14 > -7$ .

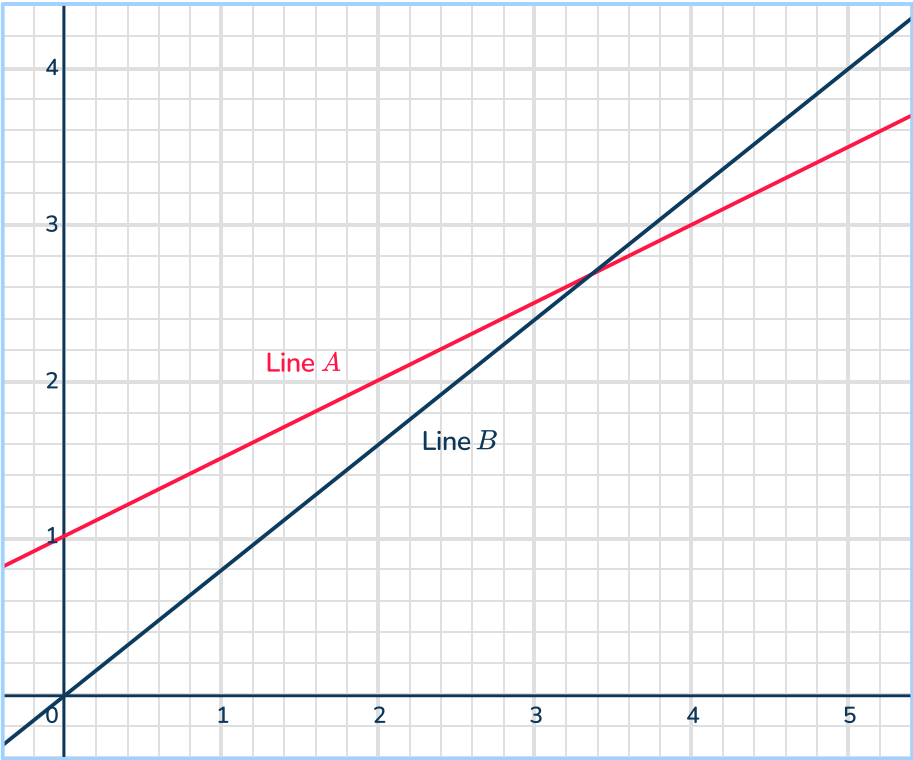
- 12 The speed of a car was measured in minutes. It was parked and then immediately began to increase its speed. The speed continued to increase for a few minutes, and then the speed stayed the same for the rest of the time. Which is a graph of the function described above?



- 13 The table below represents a partially completed input- output table. Complete the table with the correct values so that it represents a function.

Input	Output
2	5
?	7
6	?
?	?

- 14 Which statements about the two lines shown in the graph are true? Select all that apply.



- A. Line A and Line B represent proportional relationships..
- B. In Line B, for each +1 change in  $x$ , there is a  $+\frac{5}{4}$  change in  $y$ .
- C. The slope of Line B is greater than the slope of Line A.
- D. The slope of Line A is 2, which is the same as its unit rate.
- E. As a system, Line A and Line B have one solution.

15 Check off the correct classification for each equation:

	$y = x^3 - 4$	$-x + \frac{1}{2}y = -9$	$2x^2 = y$	$\sqrt{9} = y$	$x = -\frac{3}{4}$	$y = \sqrt{x}$
Linear						
Non-Linear						

16 What is the decimal equivalent to  $\frac{2}{9}$ ?

- A. 0.2
- B. 2.2
- C.  $0.\bar{9}$
- D.  $0.\bar{2}$

Unit 2: There is only 1 section in this unit.

6 questions

You are allowed to use a calculator.

- 1 Quadrilateral ABCD has points A(-4, 3), B(-4, -2), C(3, 3), and D(3, -2). The quadrilateral is dilated by a scale factor of 1.5 and then reflected over the line  $y = x$ .

Find the coordinates of the new quadrilateral:

A' ( \_\_\_\_\_, \_\_\_\_\_ )

B'( \_\_\_\_\_, \_\_\_\_\_ )


C'( \_\_\_\_\_, \_\_\_\_\_ )

D'( \_\_\_\_\_, \_\_\_\_\_ )

- 2 What is the solution to the equation?

$$-2.5(x - 2) = -2.5x + 1.5$$

Show your work in the space below.

 Answer



- 3 What is the value of the expression below?

$$\frac{0.5 \times 10^3}{2.5 \times 10^7}$$

- A.  $2 \times 10^{-5}$
- B.  $0.2 \times 10^4$
- C.  $0.5 \times 10^{-5}$
- D.  $5 \times 10^4$

- 4 Function A is represented by an equation, and Function B is represented by a table.

Based on the given information, answer the following questions.


Function A:  $\frac{1}{2}x + 50$

Function B:

$x$	0	2	4	6
$y$	44	46	48	50

Part A:

Which function has a greater rate of change? Use the space below to explain your answer.

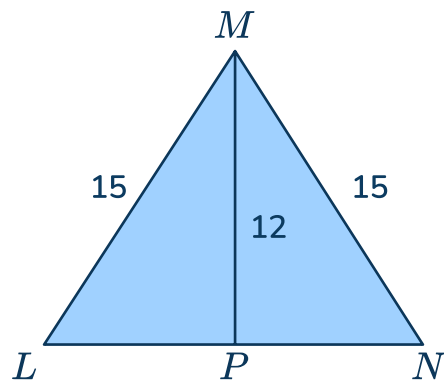
 Answer

Part B:

Are the functions increasing or decreasing? Use the space to explain your answer.

 Answer

- 5 In triangle LMN, MP is perpendicular to LN. Using the given values, find the length of LN and place your answer on the space below.



LN = \_\_\_\_\_

- 6
- Over the weekend, a group of friends rented bicycles from different bike shops. The table below shows the expression that each shop uses to calculate the cost of renting one of their bikes for  $h$  hours.

Shop	Cost for $h$ Hours (\$)
Real Wheels	$5(h+1)$
Easy Bike	$3.5h + 8.5$
Pedal Power	$2(3h - 1)$

PART A:

Kaden rented his bike from Easy Bike and he paid \$26 for the rental. Write an equation that relates the expression the bike shop uses to calculate the cost Kaden paid. Do you think Kaden rented his bike for 6 hours? Explain your justification in the space below.

 Answer

PART B:

If Kim-Ly were renting a bike for 4 hours, which shop should she rent from and why?

 Answer

Unit 3: There is only 1 section in this unit.

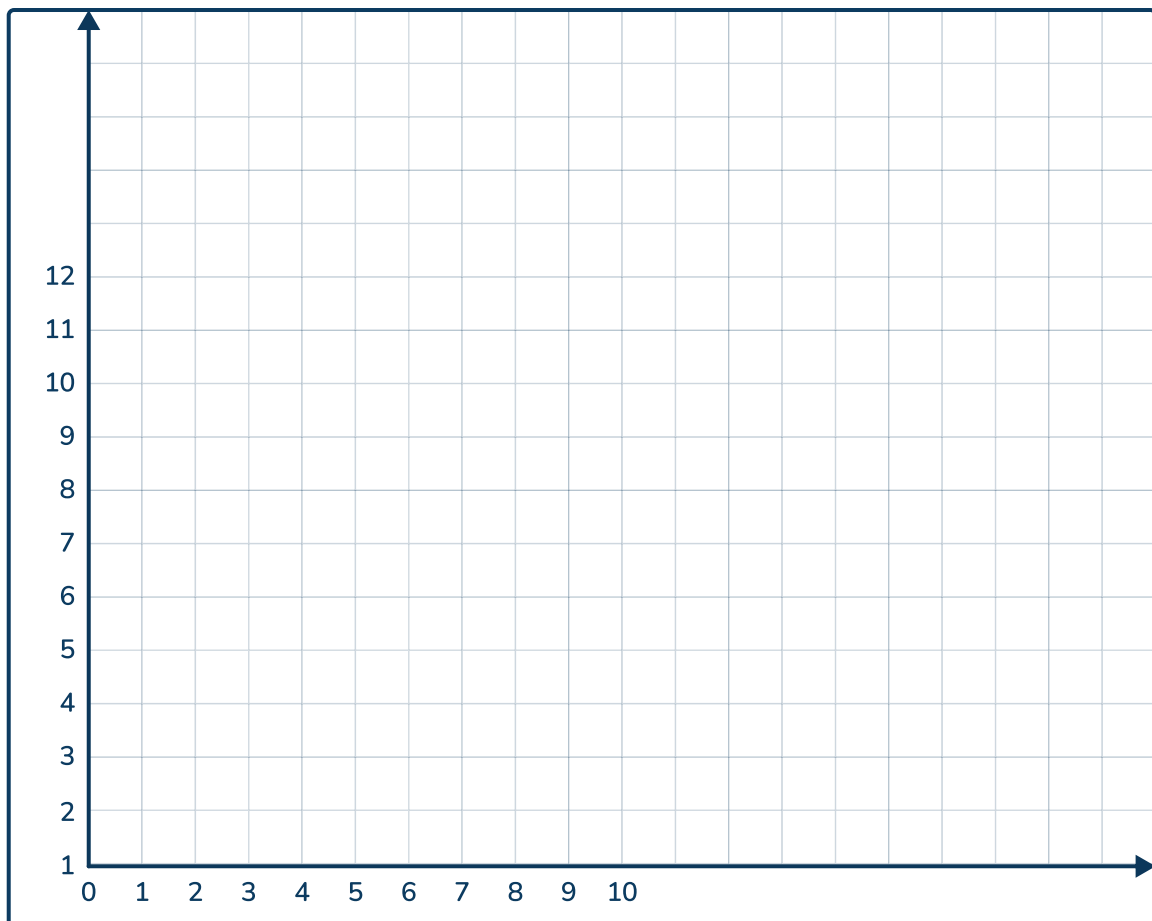
8 questions

You are allowed to use a calculator.

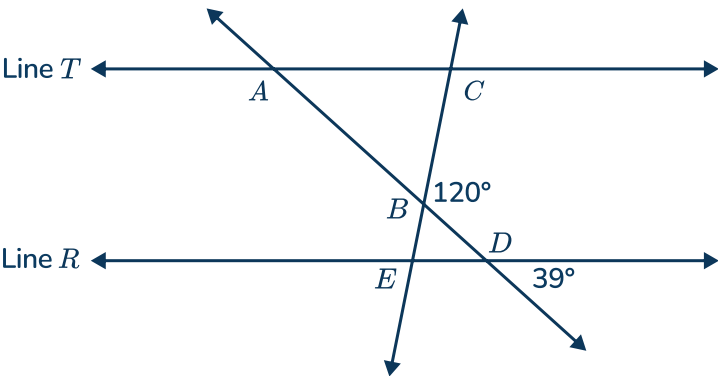
1 Simplify  $\frac{2a^4(a^2)}{\frac{1}{2}a^3}$ .

- A.  $a^3$
  - B.  $4a^2$
  - C.  $a^5$
  - D.  $4a^3$
- 

- 2 The number of cans a machine fills is proportional to the number of minutes the machine operates. The machine fills 320 cans every 40 minutes. Create a graph that shows the number of bottles,  $y$ , the machine fills in  $x$  minutes.



3 Line T and Line R are parallel lines, cut by two transversals.



Part A:

What are the measures of the interior angles that make up triangle ABC? Use the space below to show your work.

Answer

Part B:

What are the measures of the interior angles that make up triangle DBE? Use the space below to show your work.

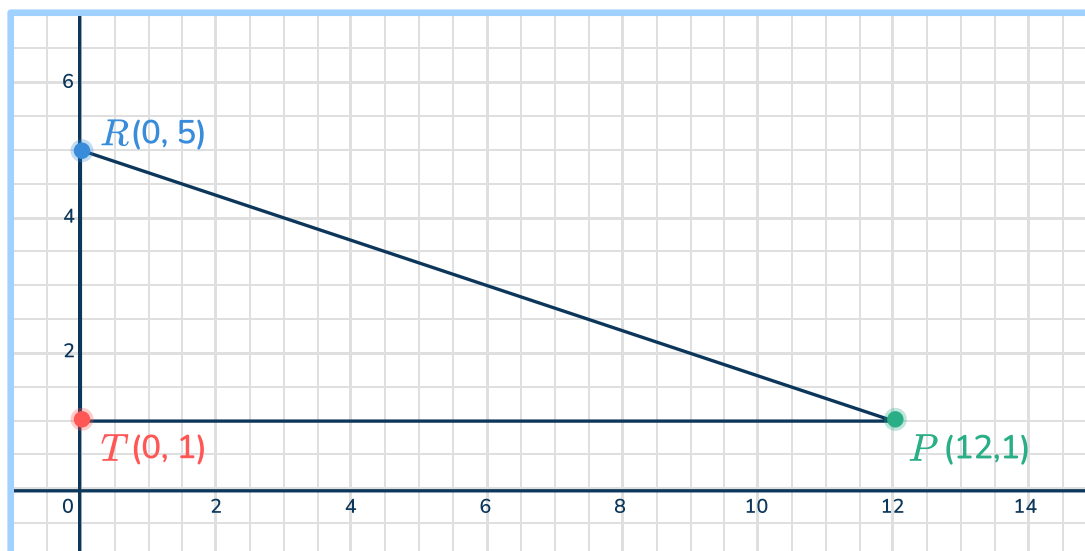
Answer

Part C:

Are triangles ABC and triangle DBE similar? Explain. Use the space below to explain your answer.

Answer

4

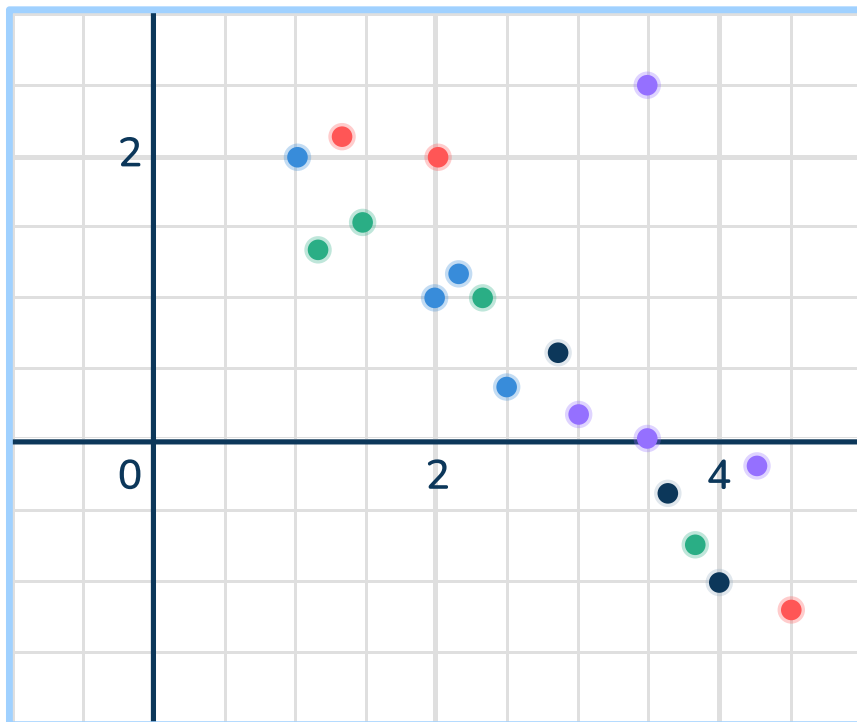


If the triangle is dilated by  $\frac{3}{4}$ , what is the distance from  $R'$  to  $P'$ ?

Which strategies lead to the correct answer? Select all that apply.

- A. Calculate  $\sqrt{4^2 + 12^2}$ , and multiply the positive root by  $\frac{3}{4}$ .
- B. Multiply each coordinate by  $\frac{3}{4}$  and then find the perimeter of the new triangle.
- C. Calculate the square root of  $5^2 + 12^2$  and multiply the positive root by  $\frac{3}{4}$ .
- D. Shift each vertex of the triangle down  $\frac{3}{4}$  units, then count the units from  $R'$  to  $P'$ .
- E. Multiply  $(0,5)$  and  $(12,1)$  by  $\frac{3}{4}$  and then calculate the positive root of  $\sqrt{9^2 + 13^2}$ .

- 5 The graph below is a scatter plot. Which statement about the scatter plot is **NOT** true?



- A. In general,  $x$  and  $y$  have a negative association
- B. The relationship between  $x$  and  $y$  looks linear.
- C. There appears to be 1 outlier.
- D. The line of best fit will have a positive slope.




- 6 Jumel and Ashley have two of the most popular phones on the market, a Droid and an iPhone. The cost of both monthly cell phone plans are described below:

**Jumel's Plan:** A monthly fee of \$60, in addition to \$0.05 per text message sent, after 20 texts.

**Ashley's Plan:** A monthly fee of \$45, in addition to \$0.35 per text message sent.


**Part A:**

Write two equations one to represent Jumel's Plan and one to represent Ashley's Plan. Let  $c$  represent the total cost and  $t$  represent the number of texts.

 Answer

**Part B:**

How much would Jumel and Ashley each pay if they sent 30 texts in a month? Show your work in the space below.

 Answer

**Part C:**

Whose plan, Jumel’s or Ashley’s, would cost less if they sent 30 texts in a month? How much less would it cost? **Show your work in the space below.**

 Answer

**Part D:**

In order for Jumel’s plan to cost less than Ashley’s, how many texts would he need to send in one month? **Show your work.**

 Answer

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



**Part A:**

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

Volume of cone:

**Part B:**

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

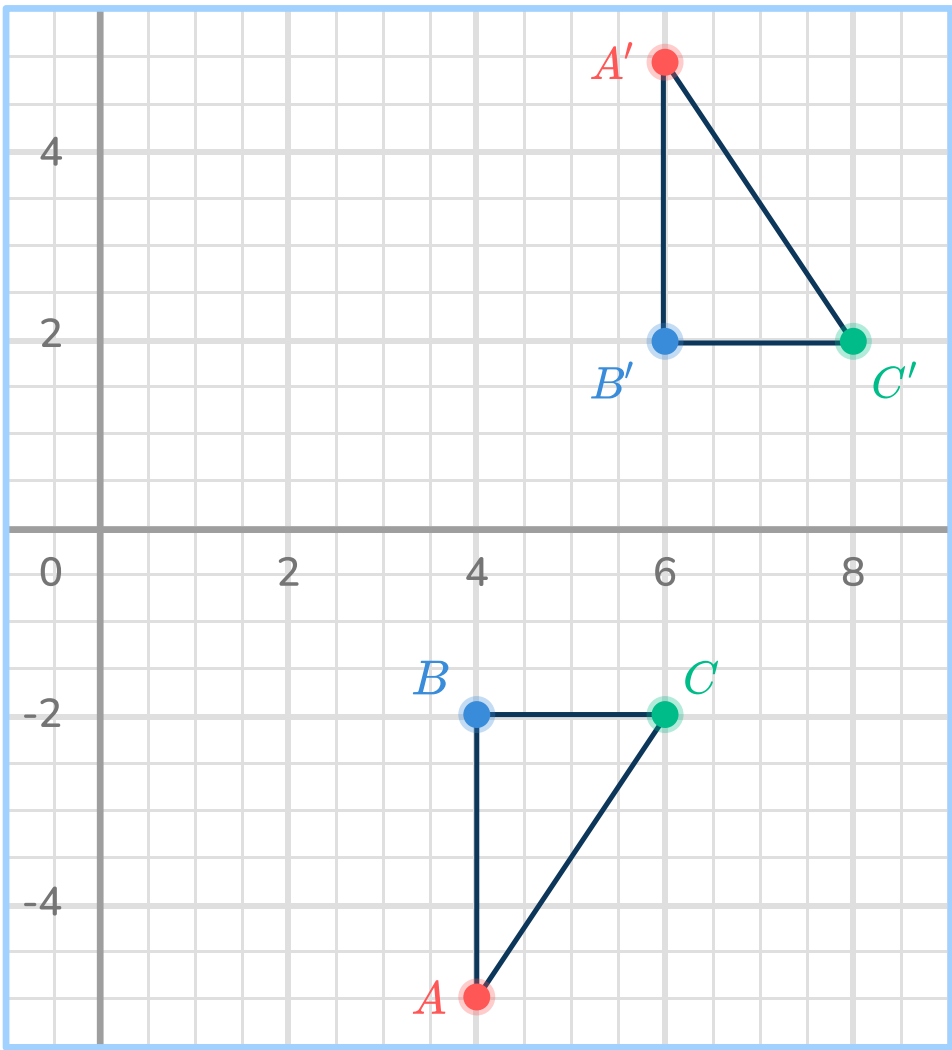
Volume of cylinder:

**Part C:**

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

Write your answer as a simplified fraction in the box below.

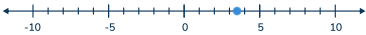
- 8 What is the sequence of transformations that maps triangle ABC to triangle A'B'C'?



Use the space below to write your answer.

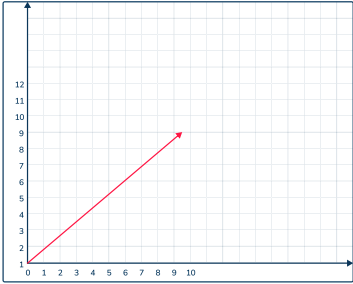
Answer

## Answer Key

Unit 1			
Item number	Correct answer	Standard(s)	DOK
1	B, D	8.NS.A.1	DOK 1
2	$p = 512$	8.EE.A.2	DOK 2
3	Increase Decrease Neither	8.F.B.5	DOK 3
4	B	8.EE.B.6	DOK 2
5	Point placed between 3 and 4 	8.NS.A.2	DOK 2
6	A,B	8.EE.A.1	DOK 2
7	(8, -6)	8.EE.C.8	DOK 2
8	B	8.F.A.1	DOK 1
9	$y = -3x + 3$	8.F.A.3	DOK 2
10	(4, 1)	8.G.A.3	DOK 2
11	B	8.F.A.2	DOK 2
12	A	8.F.B.5	DOK 2

Unit 1													
Item number	Correct answer	Standard(s)	DOK										
13	<table><tr><th>Input</th><th>Output</th></tr><tr><td>2</td><td>5</td></tr><tr><td>4</td><td>7</td></tr><tr><td>6</td><td>9</td></tr><tr><td>8</td><td>11</td></tr></table>	Input	Output	2	5	4	7	6	9	8	11	8.F.A.1	DOK 2
Input	Output												
2	5												
4	7												
6	9												
8	11												
14	C, E	8.F.A.1	DOK 2										
15	Nonlinear Linear Nonlinear Linear Linear Nonlinear	8.F.A.3	DOK 2										
16	D	8.NS.A.1	DOK 2										

Unit 2			
Item number	Correct answer	Standard(s)	DOK
1	A' (4.5, -6) B' (-3, -6) C' (4.5, 4.5) D' (-3, 4.5)	8.G.A.3	DOK 3
2	No Solution	8.EE.C.7a	DOK 2
3	A	8.EE.A.4	DOK 2
4	<b>Part A:</b> Function A: Rate of change = $\frac{1}{2}$  Function B:  $\frac{46-44}{2-0} = \frac{2}{2} = 1$  Function B has a greater rate of change <b>Part B:</b> Both functions are increasing	8.F.A.2 8.F.B.5	DOK 3
5	LN = 18	8.G.B.7	DOK 2

Unit 2			
Item number	Correct answer	Standard(s)	DOK
6	<p><b>Part A:</b> <math>3.5h + 8.5 = 26</math> <math>h = 5</math> 5 hours — No she rented the bike for 5 hours not 6 hours.</p> <p><b>Part B:</b> <math>5(4 + 1) = 25</math> \$25 <math>3.5(4) + 8.5 = 22.5</math> \$22.50 <math>2(3 \times 4 - 1) = 22</math> \$22 – Pedal Power is the cheapest</p>	8.G.A.3	DOK 3
Unit 3			
Item number	Correct answer	Standard(s)	DOK
1	D	8.EE.A.1	DOK 2
2	<p><math>y = 8x</math></p> 	8.EE.B.5	DOK 3



Unit 3			
Item number	Correct answer	Standard(s)	DOK
3	<p><b>Part A:</b> Angle A = 39 Angle B = 60 Angle C = 81</p> <p><b>Part B:</b> Angle D = 30 Angle B = 60 Angle E = 81</p> <p><b>Part C:</b> Yes, the triangles are similar because all the angles are congruent. So, through AA they are similar.</p>	<p><b>8.G.A.4</b> <b>8.G.A.5</b></p>	DOK 2
4	A, E	<p><b>8.G.A.3</b> <b>8.G.B.8</b></p>	DOK 2
5	D	<p><b>8.SP.A.1</b></p>	DOK 1

Unit 3			
Item number	Correct answer	Standard(s)	DOK
6	<p><b>Part A:</b> Jumel: <math>60 + 0.05t = c</math> Ashley: <math>45 + 0.35t = c</math></p> <p><b>Part B:</b> <math>60 + 0.05(10) = \\$60.50</math> <math>45 + 0.35(30) = \\$55.50</math></p> <p><b>Part C:</b> <math>60.50 - 55.50 = 5</math> \$5 more</p> <p><b>Part D:</b> <math>60.50 + 0.05t = 45 + 0.35t</math> <math>t = 50</math> At 50 texts both Jumel and Ashley pay the same. More than 50 texts, Jumel will pay less than Ashley.</p>	<p>8.EE.C.7 8.EE.C.8c 8.F.B.4</p>	DOK 3
7	<p><b>Part A:</b> Volume of cylinder: <math>48\pi ft^3</math></p> <p><b>Part B:</b> <math>144\pi ft^3</math></p> <p><b>Part C:</b> <math>\frac{48\pi}{144\pi} = \frac{48}{144} = \frac{1}{3}</math></p>	8.G.C.9	DOK 3
8	Reflect over the $x$ -axis and then translate 2 units right	8.G.A.3	DOK 3




Breakdown of Assessment by domain				
The Number System (NS)	Expressions and Equations (EE)	Functions (F)	Geometry (G)	Statistics and Probability (SP)
7%	33%	31%	27%	2%

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