New York NYSTP 2015 Grade 8 Math

Exam & Answer Key Materials
Pages 2 - 45

engage^{ny}

Our Students. Their Moment.

**New York State Testing Program
Grade 8 Common Core
Mathematics Test**

Released Questions

July 2015

2 The speed of light in a vacuum is 299,792,458 meters per second. Which number, written in scientific notation, is the **best** approximation of the speed of light?

A 0.3×10^7 meters per second

B 0.3×10^8 meters per second

C 3.0×10^7 meters per second

D 3.0×10^8 meters per second

**Key: D**
Primary CCLS: 8.EE,3

Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 74%

5 The graph of a system of linear equations is shown below.
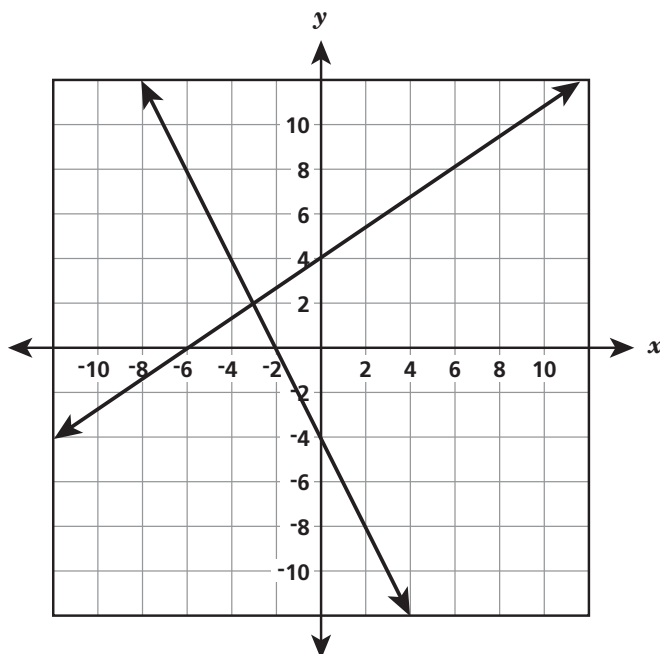
Which ordered pair is the **best** estimate for the solution of this system of linear equations?

A $(-6, -2)$

B $(-3, 2)$

C $(4, -4)$

D $(6, 8)$

Key: B
Primary CCLS: 8.EE,8,b

Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 81%

6 Which equation does **not** represent a linear function?

A $y = 2(x - 3)$

B $y = 2^2 - 3x$

C $y = \dfrac{x + 1}{5}$

D $y = 2x^2 + 3x$

Key: D
Primary CCLS: 8.F.3

Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s² giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 51%

9 The graph of a function is shown below.
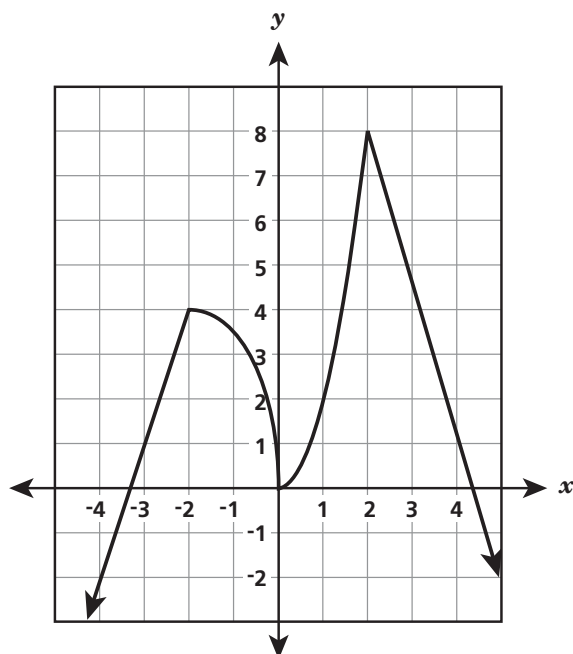
For which interval of x is the function decreasing and nonlinear?

A between -4 and -2

B between -2 and 0

C between 0 and 2

D between 2 and 4

Key: B
Primary CCLS: 8.F,5

Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 54%

12 Jenny wants to rent a truck for one day. She contacted two companies. Laguna's Truck Rentals charges $20 plus $2 per mile. Salvatori's Truck Rentals charges $3 per mile. After how many miles will the total cost for both companies be the same?

A   4

B   6

C   20

D   60

Key: C
Primary CCLS: 8.EE,8,c

Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 61%

15 What is the value of *n* in the diagram below?

$(n + 18)°$

$(2n)°$
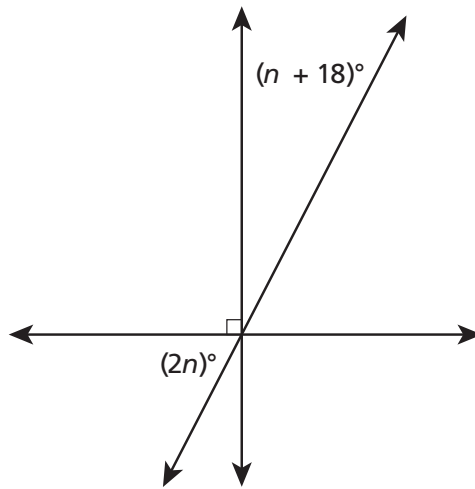
[not drawn to scale]

A 18

B 24

C 42

D 48

Key: B
Primary CCLS: 7.G,5

Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 48%

16 The cost to rent a paddleboat at the city park includes an initial fee of $7.00, plus $3.50 per hour. Which equation models the relationship between the total cost, y, and the number of hours, x, that the paddleboat is rented?

A $y = 3.5x + 7$

B $y = 7x + 3.5$

C $y = \frac{x}{7} + 3.5$

D $y = \frac{x}{3.5} + 7$

Key: A
**Primary CCLS: 8.F,4**

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 77%

20 The scatter plot below shows the numbers of customers in a restaurant for four hours of the dinner service on two different Saturday nights. The line shown models this relationship, and $x = 0$ represents 7 p.m.

RESTAURANT CUSTOMERS
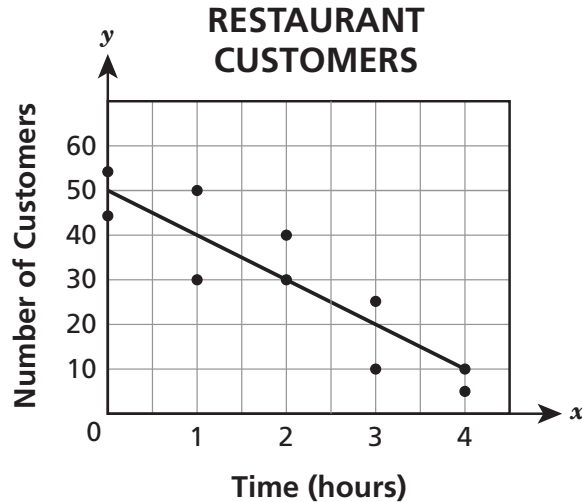
What does the value of the *y*-intercept represent?

A the average number of customers at 7 p.m.

B the average number of customers at 11 p.m.

C the average change in the number of customers each hour

D the average change in the number of customers during four hours of the dinner service

Key: A
Primary CCLS: 8.SP,3

Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 38%

25 Triangle M is similar to triangle N. Triangle M has two angles with measures of 32° and 93°. Which two angle measures could be included in triangle N?

A 32° and 58°

B 32° and 74°

C 93° and 55°

D 93° and 87°

Key: C
Primary CCLS: 8.G,5

Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 42%

26 Figure X and figure Y are shown on the coordinate grid below.
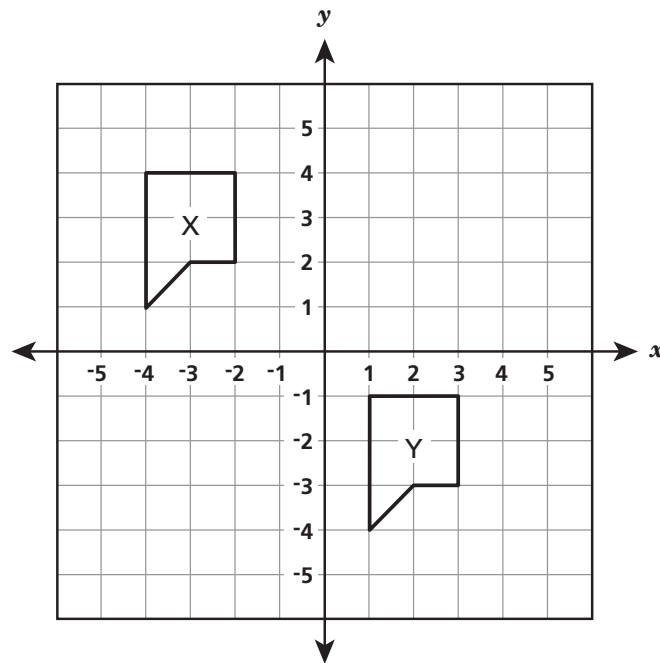
Which statement about figures X and Y **must** be true?

A A series of translations will transform figure X to figure Y, and the figures will be congruent.

B A 180° clockwise rotation will transform figure X to figure Y, and the figures will be congruent.

C A series of translations will transform figure X to figure Y, but the figures will not be congruent.

D A 180° clockwise rotation will transform figure X to figure Y, but the figures will not be congruent.

Key: A
Primary CCLS: 8.G,2

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 62%

27 Which exponential expression is equal to $2^{-5} \bullet 2^8$?

123080501_1

A $\dfrac{2^2}{2^{-1}}$

B $\left(2^3\right)^{-1}$

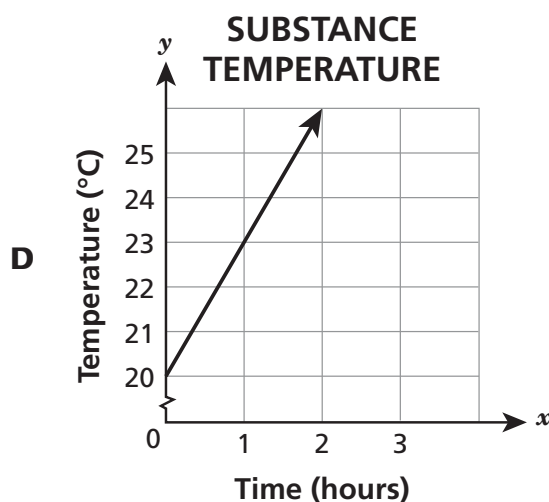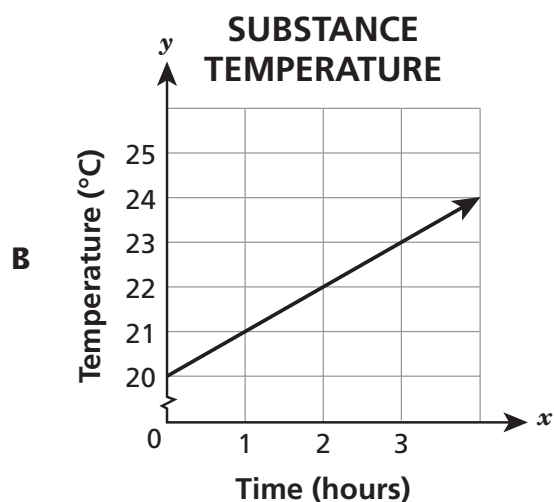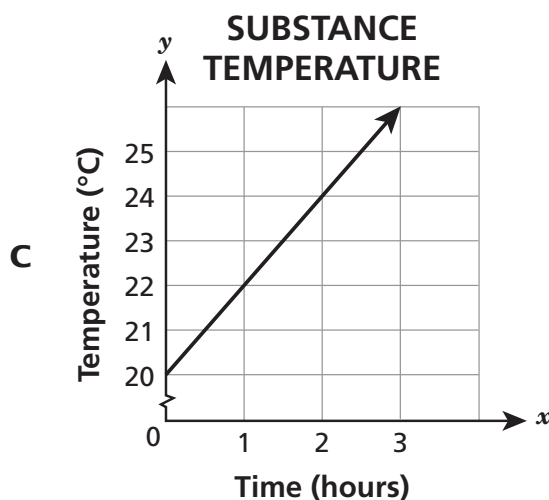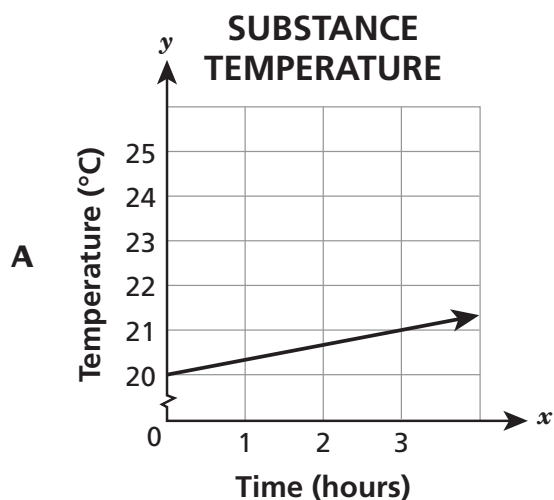C $\dfrac{2^{-2}}{2^{-1}}$

D $\left(2^{-1}\right)^3$

Key: A
Primary CCLS: 8.EE,1

Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 28%

29 During an experiment, the temperature of a substance increased at a constant rate of three degrees Celsius (°C) per hour. Which graph represents this relationship?

A

SUBSTANCE TEMPERATURE

B

SUBSTANCE TEMPERATURE

C

SUBSTANCE TEMPERATURE

D

SUBSTANCE TEMPERATURE

calculators allowed

Key: D
Primary CCLS: 8.EE,5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 66%

30 A cone has a radius of 1.2 inches and a height of 2.9 inches. What is the volume, to the nearest tenth of a cubic inch, of the cone?

A 3.6

B 4.4

C 10.6

D 13.1

calculators allowed

Key: B
Primary CCLS: 8.G,9

Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 70%

35 A line contains the points $(4, 2)$ and $(0, -1)$. What is the equation of the line?

A $y = 2x - 6$

B $y = \frac{3}{4}x - 1$

C $y = \frac{1}{4}x + 1$

D $y = \frac{4}{3}x - \frac{10}{3}$

calculators allowed

Key: B
Primary CCLS: 8.EE,6

Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 62%

36 A system of equations is shown below.

$$5x + 3y = -6$$
$$2x + y = -4$$

Which statement about the ordered pair $(-6, 8)$ is true?

A It is the only solution to the system.

B It is not a solution to either equation.

C It is one of many solutions to the system.

D It is a solution to the first but not the second equation.

calculators allowed

Key: A
Primary CCLS: 8.EE,8,b

Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 42%

38 What is the equation of the line that passes through point $(4, 12)$ and has a *y*-intercept of -2?

A $y = \dfrac{5}{2}x - 2$

B $y = \dfrac{7}{2}x - 2$

C $y = 2x - 2$

D $y = 6x - 2$

calculators allowed

Key: B
Primary CCLS: 8.EE,6

Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 43%

42 A solid object was sliced to form two new objects. Each of the two new objects had a circular base. Which shape could **not** have been the original object?

A   cone

B   cylinder

C   prism

D   sphere

calculators allowed

Key: C
Primary CCLS: 7.G.3

Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

Secondary CCLS: None

Percentage of Students Statewide Who Answered Correctly: 69%

45 Function 1 is defined by the equation $y = \frac{3}{4}x + 1$, and function 2 is represented by the graph below.
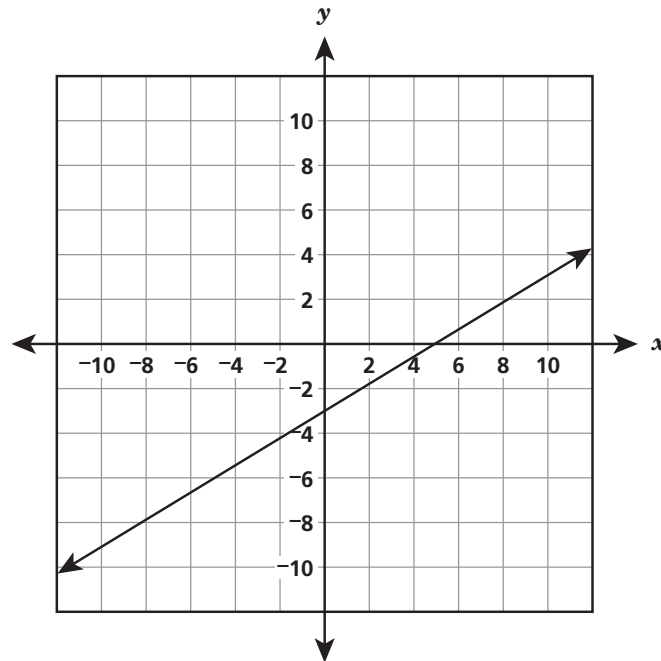
Which statement about the functions is true?

A Function 1 has the greater rate of change and the greater *y*-intercept.

B Function 2 has the greater rate of change and the greater *y*-intercept.

C Function 1 has the greater rate of change, and function 2 has the greater *y*-intercept.

D Function 2 has the greater rate of change, and function 1 has the greater *y*-intercept.

calculators allowed

Key: A
Primary CCLS: 8.F,2

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 40%

46 A cylinder has a diameter of 14 centimeters and a volume of 112π cubic centimeters. What is the height, in centimeters, of the cylinder?

A 16

B 4

C $\frac{16}{7}$

D $\frac{4}{7}$

calculators allowed

Key: C
Primary CCLS: 8.G,9

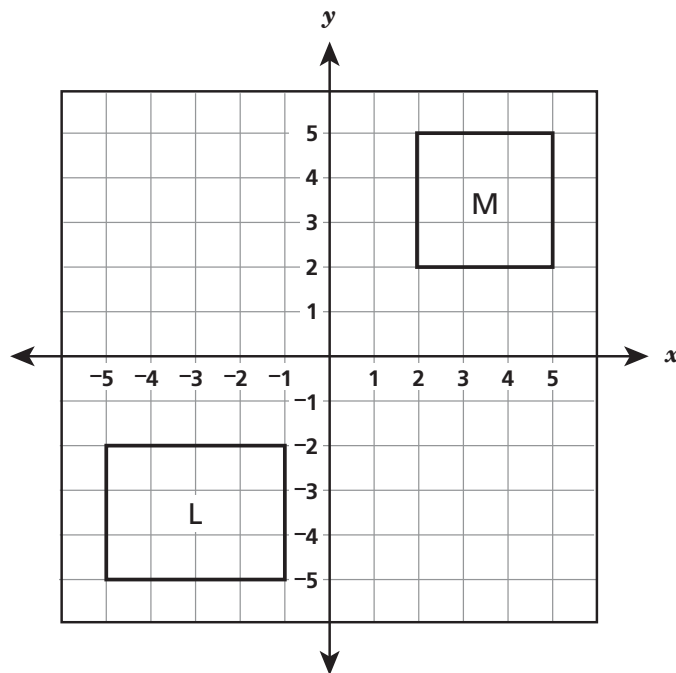Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 41%

47 Figure L and figure M are shown on the grid below.

Maria wants to transform figure L to figure M using only rotations, reflections, and translations. Which statement is true?

A The transformation can be done with a reflection followed by a rotation.

B The transformation can be done with a reflection followed by a translation.

C The transformation cannot be done because figure L is not congruent to figure M.

D The transformation cannot be done because figures L and M are in different quadrants.

calculators allowed

Key: C
Primary CCLS: 8.G,2

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 75%

49 Which statement explains why the point $(-2, 2)$ is the solution to the system of linear equations shown below?
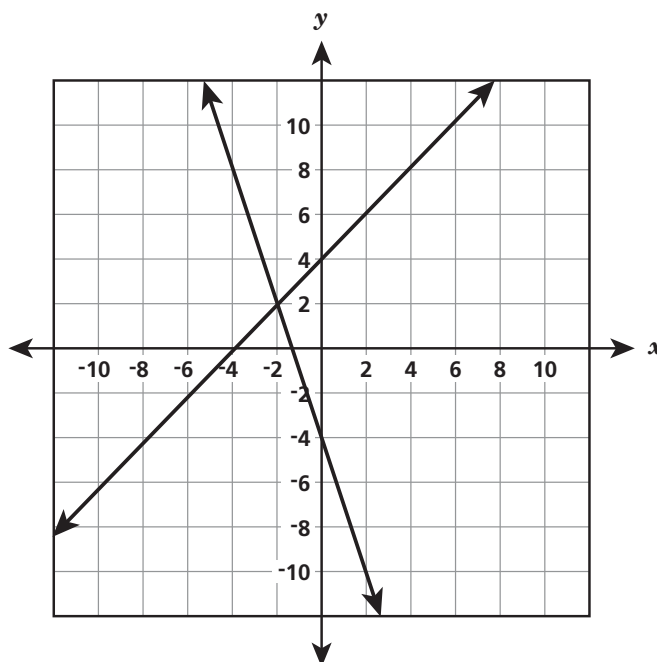
A It lies on the graph of only one of the equations.

B It lies in the second quadrant of the coordinate plane.

C It is the only point that satisfies both equations simultaneously.

D It is one of many points that satisfies both equations simultaneously.

calculators allowed

Key: C
Primary CCLS: 8.EE,8,a

Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 72%

53 The winning time for the men's 400-meter race in each of the Olympic Games from 1976 to 1996 can be modeled by the equation $y = -0.054x + 44.54$, where x is the number of years after 1976 and y is the winning time in seconds. If the relationship continues, which equation could be used to predict the winning time in the year 2020?

A $y = -0.054(1976) + 44.54$

B $y = -0.054(2020) + 44.54$

C $y = -0.054(24) + 44.54$

D $y = -0.054(44) + 44.54$

calculators allowed

Key: D
Primary CCLS: 8.SP,3

Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 40%

54 An above-ground swimming pool in the shape of a cylinder has a diameter of 18 feet and a height of 4.5 feet. If the pool is filled with water to 6 inches from the top of the pool, what is the volume, to the nearest cubic foot, of the water in the pool?

A 226

B 452

C 1,018

D 4,072

calculators allowed

Key: C
Primary CCLS: 8.G,9

Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Secondary CCLS: None
Percentage of Students Statewide Who Answered Correctly: 49%

56 Determine the number of solutions that exist to the equation below.

$$8(j - 4) = 2(4j - 16)$$

Show your work.

Answer _____

calculators allowed

Primary CCLS: 8.EE,7,a

Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

Secondary CCLS: 8.EE,7,b

Statewide Average Points Earned: 1.05 out of 2

56 Determine the number of solutions that exist to the equation below.

$$8(j - 4) = 2(4j - 16)$$

Show your work.

$$8(j-4)=2(4j-16)$$
$$8j-32=8j-32$$
$$+32+32$$
$$\frac{8j}{8}=\frac{8j}{8}$$
$$j=j$$

Answer Infinate

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The correct answer (Infinate) is given and work is done to show that both sides of the equation equal each other (8j – 32 = 8j – 32).

57 A certain function is defined as "multiply the input by $-\frac{3}{4}$, then add 2."

Graph the function on the coordinate plane below.
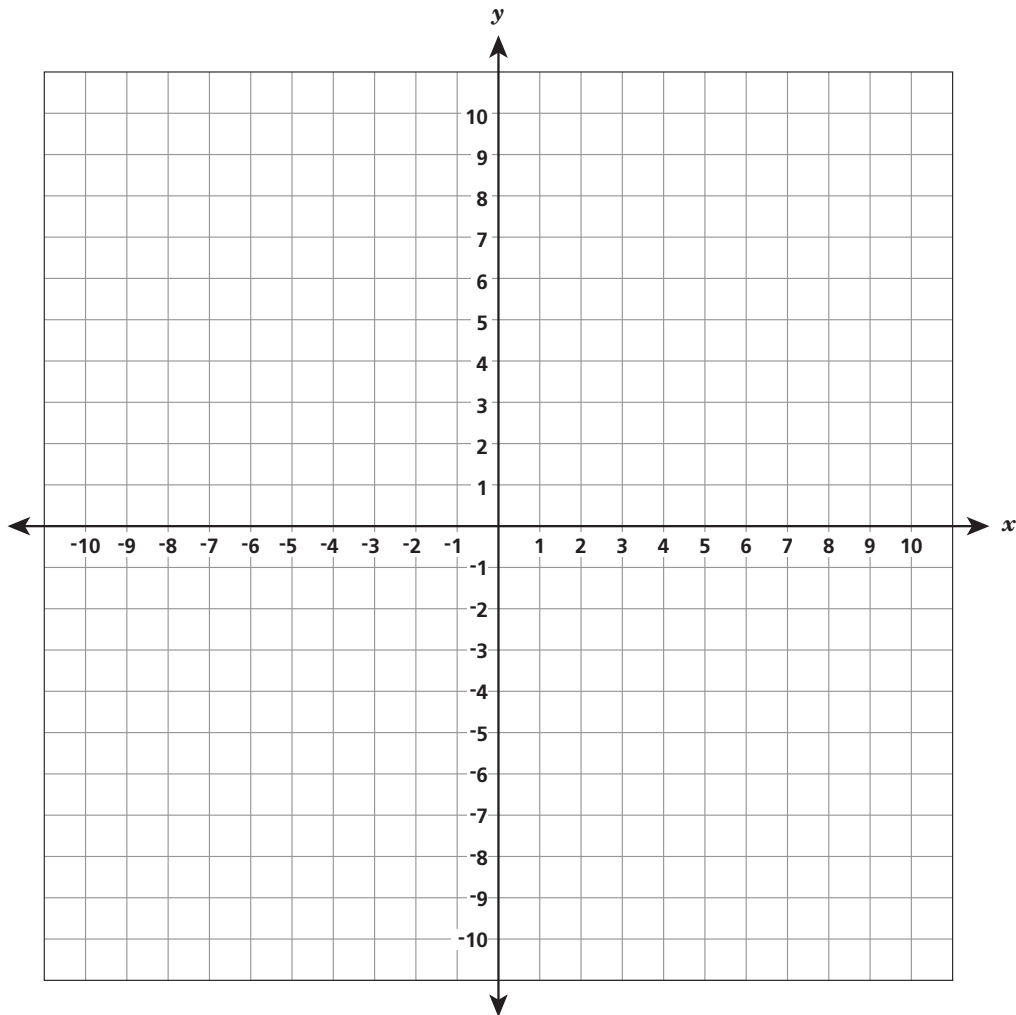
calculators allowed

Primary CCLS: 8.F.3

Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s² giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

Secondary CCLS: None
Statewide Average Points Earned: 0.88 out of 2

57   A certain function is defined as "multiply the input by $-\frac{3}{4}$, then add 2."

Graph the function on the coordinate plane below.
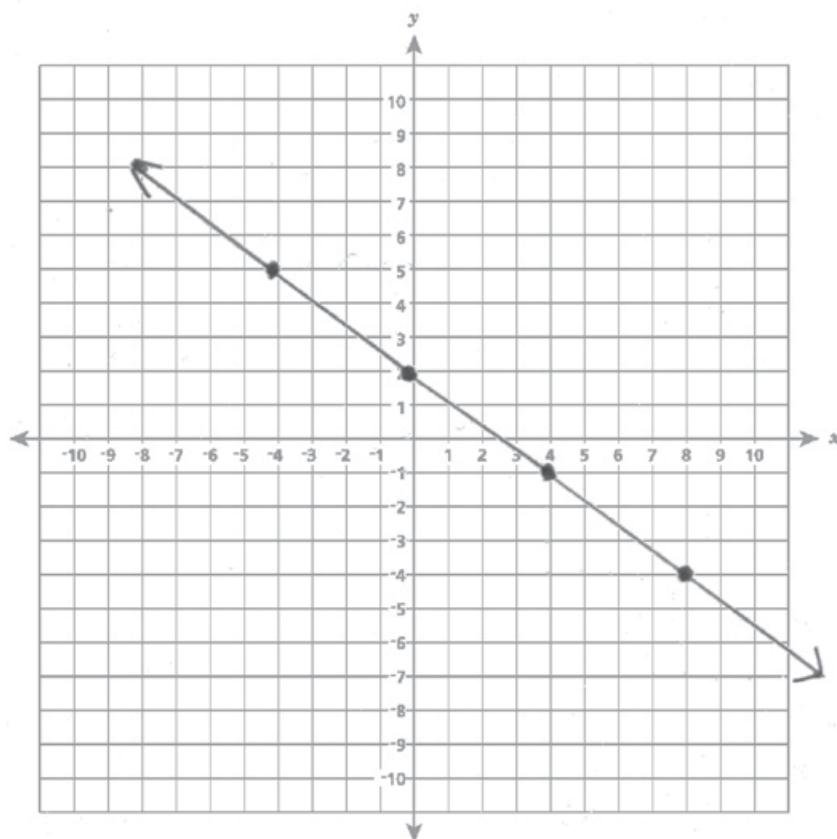
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The function is correctly graphed on the coordinate plane with a slope of $-3/4$ and y-intercept of $+2$.

58 Determine the solution to the system of equations below.

$$x - 3y = 1$$
$$3x - 5y = 11$$

Show your work.

Answer _____

calculators allowed

Primary CCLS: 8.EE,8,b

Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.

Secondary CCLS: None
Statewide Average Points Earned: 0.56 out of 2

58 Determine the solution to the system of equations below.

$$x - 3y = 1$$
$$3x - 5y - 11$$

Show your work.

$x - 3y = 1 \rightarrow x = 1 + 3y$

$3x - 5y = 11$

$3x - 5y = 11$ $x = 1 + 3y$

$3(1 + 3y) - 5y - 11$

                          $x = 1 + 3(2)$

$3 + 9y - 5y = 11$ $x = 1 + 6$

                          $x = 7$

$3 + 4y = 11$

$4y = 8$

$y = 2$

Answer $x = 7, \ y = 2$

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The correct answers (x = 7, y = 2) are written on the answer line. Work shows the first equation is rearranged to equal x (x = 1 + 3y) then 1 + 3y is substituted for x in the second equation to find y (y = 2). Then, the 2 is substituted into the equation to find x (x = 7). Determining the solution to the equations is the task, and it is acceptable to give the answer as x = 7 and y = 2.

60   What, if any, are the solutions to the equation $3(0.5x - 4) = \frac{3}{2}x - 1.2$?

Show your work.

Answer _____

calculators allowed

Primary CCLS: 8.EE,7,a

Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

Secondary CCLS: 8.EE,7,b
Statewide Average Points Earned: 0.84 out of 2

60 What, if any, are the solutions to the equation $3(0.5x - 4) = \frac{3}{2}x - 1.2$?

Show your work.

$$3(0.5x - 4) = \frac{3}{2}x - 1.2$$

$$1.5x - 12 = \frac{3}{2}x - 1.2$$

$$-\frac{3}{2}x \qquad -\frac{3}{2}x$$

$$0 - 12 = -1.2$$

$$-12 \neq -1.2$$

(NO solution)

Answer No solution

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The correct answer (NO Solution) is supported by work that results in $-12 \neq -1.2$.

61 The table below shows a relation between *x* and *y*.

x	y
−4	16
−2	4
0	0
2	4
4	16
6	36

Susie said the relation above is also a function. Explain why Susie is correct or incorrect.

_____

_____

_____

_____

calculators allowed

Primary CCLS: 8.F,1

Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

Secondary CCLS: None
Statewide Average Points Earned: 0.71 out of 2

61 The table below shows a relation between *x* and *y*.

x	y
−4	16
−2	4
0	0
2	4
4	16
6	36

Susie said the relation above is also a function. Explain why Susie is correct or incorrect.

Susie is correct because the x variable does not repeat.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task by stating that the relation is a function (Susie is correct) and by providing a correct explanation of why (because the x variable does not repeat).

62 A customer is comparing two different text message plans at Cellular Bargains. He wants to find out which plan allows the most text messages for the same cost.

The Pay Per Text Plan charges $10 per month and $0.10 for each text message. Write a function that models this plan, stating what your variables represent.

Answer _____

The Frequent Text Plan is modeled by the graph shown below.
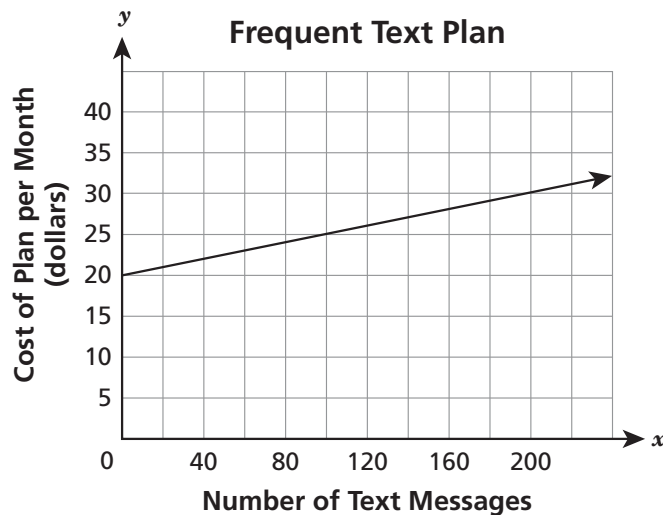
Frequent Text Plan

How many text messages would result in the same cost per month for the two plans?

Show your work.

Answer _____ text messages

calculators allowed

Primary CCLS: 8.F,4

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
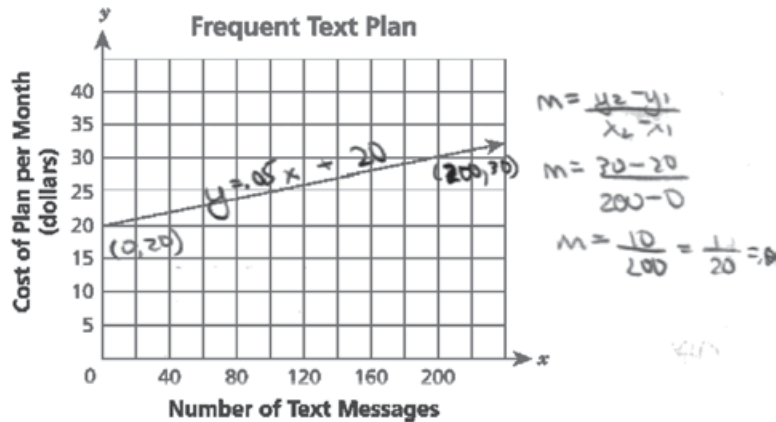
Secondary CCLS: 8.EE,8,c
Statewide Average Points Earned: 0.87 out of 3

62

A customer is comparing two different text message plans at Cellular Bargains. He wants to find out which plan allows the most text messages for the same cost.

The Pay Per Text Plan charges $10 per month and $0.10 for each text message. Write a function that models this plan, stating what your variables represent.

Answer $y = .10x + 10$ where: $y = $ total cost per month
$x = $ number of texts

The Frequent Text Plan is modeled by the graph shown below.

Frequent Text Plan

Cost of Plan per Month (dollars) vs Number of Text Messages

$y = .05x + 20$ (200, 30)   (0, 20)

$M = \frac{y_2 - y_1}{x_2 - x_1}$

$M = \frac{30 - 20}{200 - 0}$

$M = \frac{10}{200} = \frac{1}{20} = 0$

How many text messages would result in the same cost per month for the two plans?

Show your work.

$y = .10x + 10$
$-(y = .05x + 20)$
——————————
$0 = .05x - 10$
$10 = .05x$
$200 = x$

Answer ____200____ text messages

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures embodied in the task. A correct equation is given (y = .10x + 10), and the variables are correctly defined (y = total cost per month, x = number of texts). There is correct work comparing the equation of the graph and the equation that results in a correct answer (200) of how many text messages would result in the same cost per month for the two plans.

63 When △*ABC* was dilated by a scale factor of 2, centered at the origin, the result was its image △*A'B'C'* shown on the coordinate plane below. The vertices of △*A'B'C'* are *A'*(−4, 4), *B'*(−4, 6), and *C'*(2, 4).
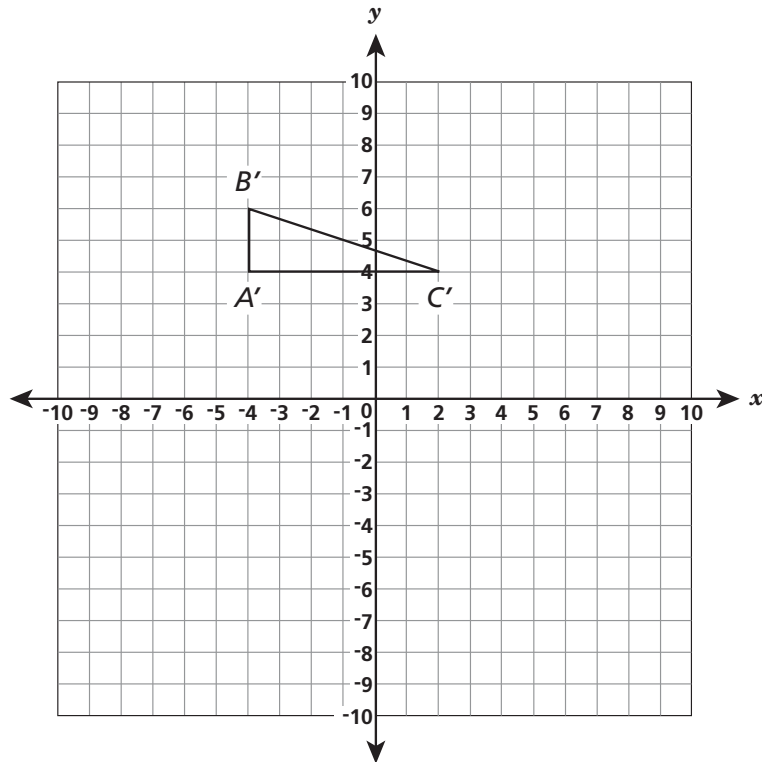
What are the coordinates of the vertices of △*ABC*?

Vertices *A* (_____ , _____) *B* (_____ , _____) *C* (_____ , _____)

Explain how you determined the coordinates of the vertices of △*ABC*.

_____

_____

Are △*ABC* and △*A'B'C'* congruent to each other, similar to each other, or neither? Explain how you determined your answer.

_____

_____

_____

_____

_____

calculators allowed

63 When △ABC was dilated by a scale factor of 2, centered at the origin, the result was its image △A'B'C' shown on the coordinate plane below. The vertices of △A'B'C' are A'($\frac{-4}{2}$, $\frac{4}{2}$), B'($\frac{-4}{2}$, $\frac{6}{2}$), and C'($\frac{2}{2}$, $\frac{4}{2}$).

$\downarrow$ $\downarrow$ $\downarrow$

A (-2, 2)   B(-2, 3)   C((1, 2)

What are the coordinates of the vertices of △ABC?

Vertices A (-2 , 2) B (-2 , 3) C (1 , 2)

Explain how you determined the coordinates of the vertices of △ABC.

I used the opposite operation of what was used to get A'B'C'. So, I divided A'B'C' by the scale factor (2) to get the coordinates of △ABC.

Are △ABC and △A'B'C' congruent to each other, similar to each other, or neither? Explain how you determined your answer.

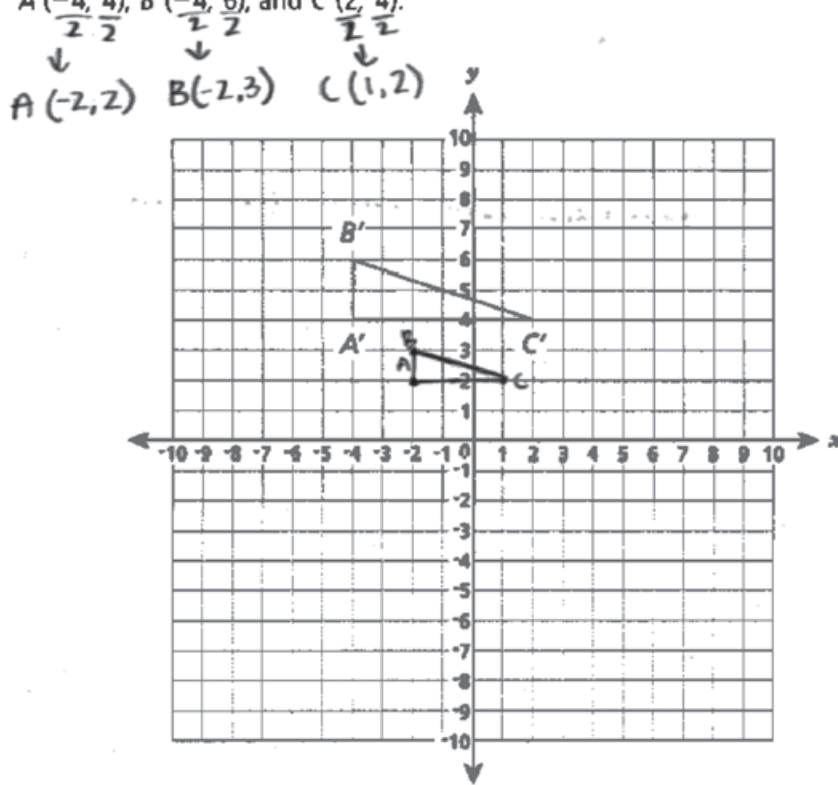△ABC and △A'B'C' are similar. I determined my answer because △A'B'C' is just a dilated version of △ABC. This means that they are the same shape, just different sizes.

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures embodied in the task. Correct coordinates for the triangle ABC are provided. A correct statement of how to determine those coordinates (I divided A′B′C′ by the scale factor 2) is written. The correct response (similar) with an explanation is given for the two triangles being similar (same shape, just different sizes).

64 Quadrilateral *ABCD* is graphed on a coordinate plane.

- Abby reflected *ABCD* over the *x*-axis and then rotated it 90° clockwise about the origin. She labeled the final image *EFGH*.
- Manny dilated *ABCD* by a scale factor of 3 and then translated the resulting figure 2 units left. He labeled the final image *PQRS*.

Identify a pair of quadrilaterals from the three quadrilaterals *ABCD*, *EFGH*, and *PQRS* that are congruent.

Answer _____

Identify a pair of quadrilaterals from the three quadrilaterals *ABCD*, *EFGH*, and *PQRS* that are similar but not congruent.

Answer_____

Describe a transformation on Abby's quadrilateral *EFGH* that would make the resulting image *E′F′G′H′* congruent to Manny's quadrilateral *PQRS*.

_____

_____

_____

_____

calculators allowed

Primary CCLS: 8.G,4

Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

Secondary CCLS: None
Statewide Average Points Earned: 1.54 out of 3

64 Quadrilateral *ABCD* is graphed on a coordinate plane.

- Abby reflected *ABCD* over the x-axis and then rotated it 90° clockwise about the origin. She labeled the final image *EFGH*.
- Manny dilated *ABCD* by a scale factor of 3 and then translated the resulting figure 2 units left. He labeled the final image *PQRS*.

Identify a pair of quadrilaterals from the three quadrilaterals *ABCD*, *EFGH*, and *PQRS* that are congruent.

Answer ABCD + EFGH

Identify a pair of quadrilaterals from the three quadrilaterals *ABCD*, *EFGH*, and *PQRS* that are similar but not congruent.

Answer EFGH + PQRS

Describe a transformation on Abby's quadrilateral *EFGH* that would make the resulting image *E'F'G'H'* congruent to Manny's quadrilateral *PQRS*.

Abby would have to dilate the quadrilateral by a scale factor of 3.
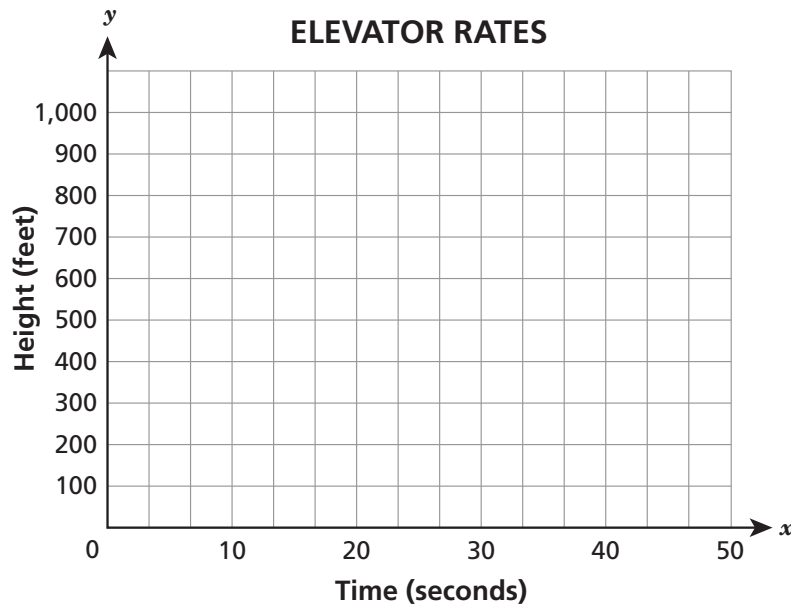

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures embodied in the task. A correct answer (ABCD + EFGH) is given for the congruent quadrilaterals, and a correct set of quadrilaterals that are similar (EFGH + PQRS) is also given. A correct transformation and scale factor (dilate the quadrilateral by a scale factor of 3) is used to make E´F´G´H´ congruent to PQRS.

65 The express elevator in the Empire State Building in New York City travels nonstop from the ground floor to the top floor at a rate of 1,400 feet per minute.

The express elevator in the John Hancock Center in Chicago travels nonstop from the ground floor to the observatory on the top floor at a rate represented by the equation $y = 30x$, where y is the height, in feet, and x is the number of seconds.

Graph the two relationships on the grid below to compare the rates of the two elevators.

ELEVATOR RATES

y — Height (feet)

1,000
900
800
700
600
500
400
300
200
100

0   10   20   30   40   50   *x*

Time (seconds)

Which elevator travels at a faster rate?

Using the information from the graph, explain how you got your answer.

Answer

_____

_____

_____

calculators allowed

Primary CCLS: 8.EE,5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Secondary CCLS: None
Statewide Average Points Earned: 0.99 out of 3

65 The express elevator in the Empire State Building in New York City travels nonstop from the ground floor to the top floor at a rate of 1,400 feet per minute.

The express elevator in the John Hancock Center in Chicago travels nonstop from the ground floor to the observatory on the top floor at a rate represented by the equation $y = 30x$, where y is the height, in feet, and x is the number of seconds.

Graph the two relationships on the grid below to compare the rates of the two elevators.

ELEVATOR RATES *Chicago elevator*

NYC elevator

Height (feet) / Time (seconds)
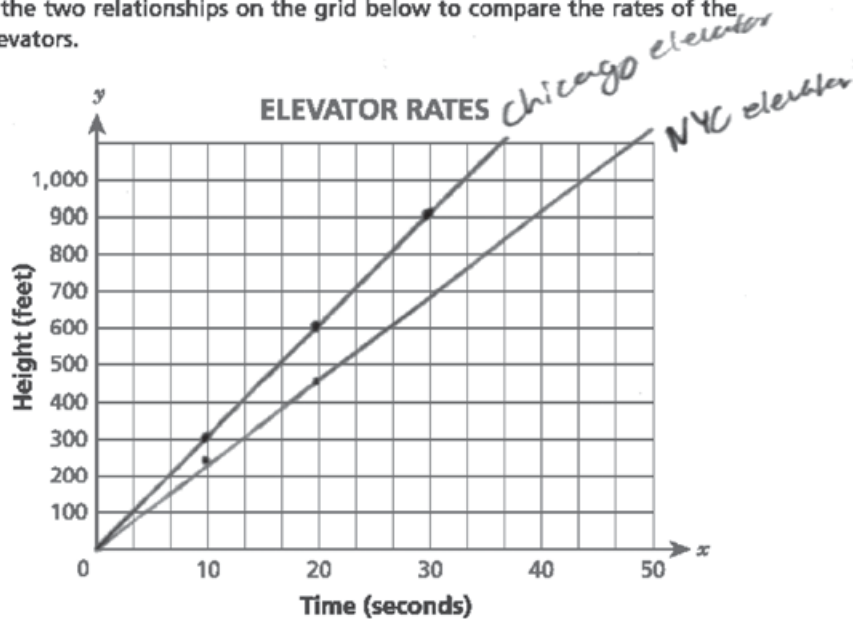
Which elevator travels at a faster rate?

Chicago elevator

Using the information from the graph, explain how you got your answer.

Answer

The chicago elevators rate equation has a greater m value.

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures embodied in the task. Both graphs are correct. A correct answer (Chicago elevator) is given with an explanation for which elevator travels at a faster rate (has a greater m value). The "m" is from the equation y = mx + b and represents the slope which is correct.

2-Point Holistic Rubric

Score Points:

2 Points	A two-point response includes the correct solution to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution and the demonstration of a thorough understanding
1 Point	A one-point response demonstrates only a partial understanding of the mathematical concepts and/or procedures in the task. This response • correctly addresses only some elements of the task • may contain an incorrect solution but applies a mathematically appropriate process • may contain the correct solution but required work is incomplete
0 Points*	A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

3-Point Holistic Rubric

Score Points:

3 Points	A three-point response includes the correct solution(s) to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution(s) and the demonstration of a thorough understanding
2 Points	A two-point response demonstrates a partial understanding of the mathematical concepts and/or procedures in the task. This response • appropriately addresses most, but not all, aspects of the task using mathematically sound procedures • may contain an incorrect solution but provides sound procedures, reasoning, and/or explanations • may reflect some minor misunderstanding of the underlying mathematical concepts and/or procedures
1 Point	A one-point response demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task. This response • may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete • exhibits multiple flaws related to misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning • reflects a lack of essential understanding of the underlying mathematical concepts • may contain the correct solution(s) but required work is limited
0 Points*	A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

2015 2- and 3-Point Mathematics Scoring Policies

Below are the policies to be followed while scoring the mathematics tests for all grades:

1. If a student does the work in other than a designated "Show your work" area, that work should still be scored. (Additional paper is an allowable accommodation for a student with disabilities if indicated on the student's Individual Education Program or Section 504 Accommodation Plan.)

2. If the question requires students to show their work, and the student shows appropriate work and clearly identifies a correct answer but fails to write that answer in the answer blank, the student should still receive full credit.

3. In questions that provide ruled lines for students to write an explanation of their work, mathematical work shown elsewhere on the page should be considered and scored.

4. If the student provides one legible response (and one response only), teachers should score the response, even if it has been crossed out.

5. If the student has written more than one response but has crossed some out, teachers should score only the response that has **not** been crossed out.

6. Trial-and-error responses are **not** subject to Scoring Policy #5 above, since crossing out is part of the trial-and-error process.

7. If a response shows repeated occurrences of the same conceptual error within a question, the student should **not** be penalized more than once.

8. In questions that require students to provide bar graphs,

   - in Grades 3 and 4 only, touching bars are acceptable
   - in Grades 3 and 4 only, space between bars does **not** need to be uniform
   - in all grades, widths of the bars must be consistent
   - in all grades, bars must be aligned with their labels
   - in all grades, scales must begin at 0, but the 0 does **not** need to be written

9. In questions requiring number sentences, the number sentences must be written horizontally.

10. In pictographs, the student is permitted to use a symbol other than the one in the key, provided that the symbol is used consistently in the pictograph; the student does not need to change the symbol in the key. The student may **not**, however, use multiple symbols within the chart, nor may the student change the value of the symbol in the key.

11. If students are not directed to show work, any work shown will not be scored. This applies to items that do not ask for any work and items that ask for work for one part and do not ask for work in another part.

12. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question but that work results in a score of zero.