New York State Testing Program

2018

Mathematics Test

Grade 8

Scoring Leader Materials

Training Set

Grade 8 Mathematics Reference Sheet

CONVERSIONS

1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5,280 feet	1 pound = 0.454 kilogram	1 quart = 2 pints
1 mile = 1,760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2,000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallon
		1 liter = 1,000 cubic centimeters

FORMULAS

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pythagorean Theorem	$a^2 + b^2 = c^2$

2-Point Holistic Rubric

2 Point	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 Point*	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

3 Point	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 Point	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 Point*	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).

2018 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 shows the work in other than a designated "Show your work" or "Explain" area, that work should still be scored.

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 space, the student should still receive full credit.

3. If students are directed to show work, a correct answer with **no** work shown receives **no** credit.

4. 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.

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

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

7. If the student provides more than one response, but does not indicate which response is to be considered the correct response and none has been crossed out, the student shall not receive full credit.

8. If the student makes a conceptual error (that is an error in understanding rather than an arithmetic or computational error), that student shall not receive more than 50% credit.

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

10. If a response shows repeated occurrences of the same conceptual error within a question, the conceptual error should **not** be considered more than once in gauging the demonstrated level of understanding.

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

12. When measuring angles with a protractor, there is a +/- 5 degrees deviation allowed of the true measure.

13. 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.

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

Answer   Number of solution(s) _____

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$$3(x) + 3(-2) + 7x = \frac{1}{2}(6x) + \frac{1}{2}(-2)$$

$$3x - 6 + 7x = 3x - 1$$

$$10x - 6 = 3x - 1 \qquad or \qquad 7x - 6 = -1$$

Visual inspection: each side is a line in slope-intercept form.

The slopes are different meaning they will intersect once.

(Not necessary to solve past this point)

$$7x = 5$$

$$x = \frac{5}{7} \approx 0.71$$

or other valid process

Answer   Number of solution(s) _____ **1** _____

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$$3x - 6 + 7x = 3x - 1$$
$$+6 \qquad +6$$

$$3x + 7x = 3x + 5$$
$$10x = 3x + 5$$
$$-3x \quad -3x$$

$$7x = 5$$
$$\frac{7x}{7} = \frac{5}{7}$$

one solution

Answer Number of solution(s) _____

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct answer is determined using sound procedures. Per Scoring Policy #2, a correct answer not written in the answer space still receives full credit.

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$3x - 6 + 7x = 3x - 1$
$10x - 6 = 3x - 1$
$\underline{-3x \qquad -3x}$
$7x - 6 = -1$
$\underline{+6 \qquad = +6}$
$7x = 5$
$\dfrac{7x}{7} \; \dfrac{5}{7}$
$x = .714$

Answer   Number of solution(s)   1

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct answer is determined using sound procedures.

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

> $3(x - 2) + 7x = \frac{1}{2}(6x - 2)$
>
> 3x - 6 + 7x = 3x - 1
>
> 10x - 6 = 3x - 1

Answer   Number of solution(s) | 1 |

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct answer is determined using sound procedures.

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$$3x - 6 + 7x = 3x - 1$$
$$10x - 6 = 3x - 1$$
$$10x - 6 - 3x = 3x - 1 - 3x$$
$$7x - 6 + 6 = -1 + 6$$
$$7x = 5$$
$$x = \frac{7}{5}$$

Answer   Number of solution(s) $\boxed{1}$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. Although the correct answer is provided, the work contains a calculation error in the final step. The response correctly addresses only some elements of the task.

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$$3(x-2) + 7x = \frac{1}{2}(6x - 2)$$

$$3x - 6 + 7x = 3x - 1$$

$$\frac{10x - 6}{3} \doteq \frac{3x - 1}{3} + 6$$

$$10x-6 = 3x + 5$$

$$7x - 3 = -3$$

$$\frac{7x}{7} = \frac{5}{7}$$

$$x = .7$$

Answer Number of solution(s) _____.7_____

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The equation is solved correctly; however, the value of *x* is written as the answer rather than the number of solutions that exist. The response correctly addresses only some elements of the task.

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$$3x - 6 + 7x = 3x - 1$$
$$10x - 6 = 3x - 1$$

Answer Number of solution(s) _____

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The equation is solved correctly to a point where visual inspection reveals the number of solutions; however, the answer is incorrect. The response correctly addresses only some elements of the task.

41

An equation is shown below.

$$3(x - 2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$$3(X-2)+7X = \frac{1}{2}(6X-2)$$

both
have
x's //
only one solution

Answer Number of solution(s) __one__

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Although the answer is correct, it is chosen for an incorrect reason. The work does not support the correct solution.

41

An equation is shown below.

$$3(x-2) + 7x = \frac{1}{2}(6x - 2)$$

How many solutions, if any, does the equation have?

Show your work.

$$3(x-2) + 7x = \frac{1}{2}(6x - 2)$$
$$3x - 6 + 7x = 3x - 1$$
$$10x - 6 = 2x$$
$$4x = 2x$$
$$2x$$

$$3(x-2) + 7x = \frac{1}{2}(6x - 2)$$
$$3x - 6 + 7x = 3x - 1$$
$$6x - 6 + 7x - 1$$
$$13 - 6 - 1$$
$$7 - 1$$
$$6$$

Answer   Number of solution(s)   2

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. The equation is solved incorrectly twice and the answer is incorrect.

42

Line n passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line n is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

_____

_____

_____

42

Line n passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line n is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

$$m = \frac{(-5) - (-7.5)}{(2) - (-3)} = \frac{+2.5}{5} = 0.5$$

$$y = mx + b$$
$$(-5) = 0.5(2) + b$$
$$-5 = 1 + b$$
$$-6 = b$$

Tahlia found the slope but she forgot to find the y-intercept. The correct equation is $y = 0.5x - 6$.

or other valid explanation

42

Line *n* passes through the points (−3, −7.5) and (2, −5). Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

The error Tahlia made determinating the equation was that she forgot to include the y-intercept. She only found the slope but didn't substitute an order pair in the equation to get the answer −6 as the y intercept. The full equation is y= 0.5x −6.

−3, −7.5   2, −5

−3 = 1.50

$$\frac{-7.5 + 5}{-3 - 2} = \frac{-2.5}{-5} = \frac{1}{2}$$

y = 0.5x + b
−7.5 = 0.5(−3) + b
−7.5 = −1.5 + b
+1.5   +1.5
_____
−6.0 = b

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. Tahlia's error is correctly identified and the correct equation is included.

42

Line *n* passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

Tahlia calculated the slope correctly, however, the y-intercept (b) is not 0. To find the y-intercept, you can either use the point slope formula, or substitute y=mx+b. I substituted and found that the y-intercept was -6. Thus, the correct equation is y=0.5x-6.

Slope:

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - (-7.5)}{2 - (-3)} = \frac{-5 + 7.5}{2 + 3} = \frac{2.5}{5} = \frac{25}{50} = \frac{1}{2}$$

$y = mx + b$ Point: $(2, -5)$

$-5 = \frac{1}{2}(2) + b$

$-5 = 1 + b$

$-6 = b$

Correct Equation ⟹

$y = 0.5x - 6$

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. Tahlia's error is correctly identified and the correct equation is included.

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42

Line *n* passes through the points (−3, −7.5) and (2, −5). Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

Tahlia did not include the proper y-intercept in her equation. It should be $y = .5x - 6$

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. Tahlia's error is correctly identified and the correct equation is included.

42

Line *n* passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

The error was that Tahlia didn't include the y intercept.

$$m = \frac{\Delta y}{\Delta x} \quad m = \frac{-7.5 - 5}{-3 - 2} \quad m = \frac{-2.5}{-5}$$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. Tahlia's error is correctly identified; however, the correct equation is not included. The response addresses only some elements of the task.

42

Line *n* passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

Tahlia forgot to add or subtract to determine the value of y. The equation is:

$$y = .5x - 6$$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The correct equation is included; however, the explanation is not sufficient to identify Tahlia's error in the *y*-intercept. The response correctly addresses only some elements of the task.

42

Line *n* passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

Tahlia's equation is wrong because she didn't include the y-intercept.

The correct equation was y= .5x +6

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - -7.5}{2 - -3} = \frac{2.5}{5} = 0.5$$

$$y = .5x + 6$$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. Tahlia's error is correctly identified; however, the included equation is incorrect with a *y*-intercept of +6 rather than −6. The response correctly addresses only some elements of the task.

42

Line *n* passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

Based on my work, Tahlia didn't make an error. The equation y=.5x is correct.

$$\begin{array}{c|c} x & y \\ \hline -3 & -7.5 \\ 2 & -5 \end{array}$$

$5(\quad)2.5$

$$\frac{\Delta y}{\Delta x} = \frac{2.5}{5} = .5$$

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. The response incorrectly states that Tahlia did not make an error.

42

Line *n* passes through the points $(-3, -7.5)$ and $(2, -5)$. Tahlia determined that the equation of line *n* is $y = 0.5x$. Explain the error Tahlia made while determining her equation. Be sure to include the correct equation in your explanation.

Answer

The error Tahlia made was she divided 2.5 to get -5 as the slope. The correct equation is y=2.5x. when you plug in the coordinates into y=2.5x, you will see the equation is true.

$(\overset{x_1}{-3}, \overset{y_1}{-7.5})$ $M = \dfrac{5 - ^-7.5}{2 - ^-3} = \dfrac{12.5}{5} = 2.5$ $y = 2.5x$

$(\overset{x_2}{2}, \overset{y_2}{5})$ slope : 2.5

$y = .5x$ $y = .5x$

$-7.5 = .5(-3)$ $-5 = .5(2)$

$-7.5 \neq -1.5x$ $-5 \neq 1x$

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Tahlia's error is identified incorrectly and the *y*-intercept is not addressed.

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A $(2, 7)$

- C $(8, 1)$

- D $(2, 1)$

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square A′B′C′D′. What are the coordinates of vertex B′?

Explain how you determined your answer.

_____

_____

_____

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A (2, 7)
- C (8, 1)
- D (2, 1)

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square A′B′C′D′. What are the coordinates of vertex B′?

Explain how you determined your answer.

B′(16, 14)
The original vertex B is at (8, 7) because all sides of a square have to be equal, so it must be 6 units right of A and 6 units above C. Then, the dilation multiplies both the x- and y-coordinates by 2, so 8×2 = 16 and 7 × 2 = 14.

or other valid explanation

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A (2, 7)

- C (8, 1)

- D (2, 1)

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square A′B′C′D′. What are the coordinates of vertex B′?

Explain how you determined your answer.

> The coordinates of vertex B' are (16,14) because to make a square all sides are equal therfore the distance between each vertex must be the same. Since coordinate C and coordinate D are 6 units apart, coordinate A and coordinate B must also be 6 units apart. Also, since coordinate A and coordinate D are 6 units apart, then coordinate B and coordinate C must also be 6 units apart. Then to dialate it you just multiply each coordinate by the scale factor, which is 2.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The coordinates of vertex B′ and the explanation are correct.

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A (2,7)   B(8, 7) $\xrightarrow{D_2}$ B'(16,14)
- C (8,1)
- D (2,1)

Square ABCD is <u>dilated by a scale factor of 2</u> with the <u>center of dilation at the origin,</u> to <u>form square A'B'C'D'</u>. What are the <u>coordinates of vertex B'</u>?

Explain how you determined your answer.

The coordinates of vertex B' are B'(16,14) because the coordinates of B are B(8, 7), because each side of the square has a length of 6 units and since the square is dilated by 2, then the coordinates of B are all multiplied by 2, to form B'.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The coordinates of vertex B′ and the explanation are correct.

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A $(2, 7)$
- C $(8, 1)$
- D $(2, 1)$

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square $A'B'C'D'$. What are the coordinates of vertex B'?

Explain how you determined your answer.

> The coordinates of vertex B' are (16,14). This is because the original coordinates of B were (8,7). They were (8,7) because those were the only coordinates to create the square. After I got those coordinates I multiplied 8 and 7 by two because it was scale factor of 2. Those coordinates came out as (16,14) which is the answer.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The coordinates of vertex B' and the explanation are correct.
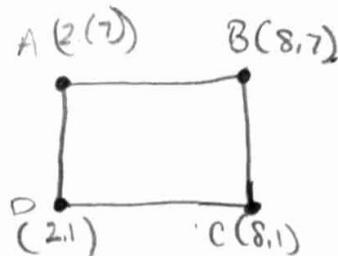
43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A(2,7)
- C(8,1)
- D(2,1)

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square A'B'C'D'. What are the coordinates of vertex B'?

Explain how you determined your answer.

Dialated means it is expanding. When you Multiply 2 to every number you get there prime.

. A' (4,14)

· C' (16, 2)

· D' (4, 2)

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The dilation is applied correctly to determine the coordinates of vertices A′, C′, and D′; however, vertices B and B′ are not addressed. The response addresses only some elements of the task.

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A $(2,7)$

- C $(8,1)$

- D $(2,1)$

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square $A'B'C'D'$. What are the coordinates of vertex B'?

Explain how you determined your answer.

> B' coordinates are (16,12) because if its a square all the side are equal so point B would have to be 6 units above point C and then multiplying that by 2 will give the point (16,12)

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The explanation correctly describes the process to determine the coordinates of vertex B'; however, the y-coordinate of B' is incorrect. The response contains an incorrect solution but applies an appropriate process.

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A (2,7)
- C (8,1)
- D (2,1)

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square A'B'C'D'. What are the coordinates of vertex B'?

Explain how you determined your answer.

Coordinates for Point B (8,7), To form a square Point B would have to be parallel to Point A and parallel with Point C. So the Coordinates (8,7) would be the most logical. Lines A & C intersect and form a square at (8,7,) also.

A (2(7))   B(8,7)

D (2,1)   C(8,1)

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The explanation correctly describes the process to determine the coordinates of vertex B; however, the dilation is not addressed. The response addresses only some elements of the task.

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A (2, 7)

- C (8, 1)

- D (2, 1)

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square A′B′C′D′. What are the coordinates of vertex B′?

Explain how you determined your answer.

> The coordinates for vertex B' would be (6,5) because it starts at vertext B with (8,7) when you dialate it by 2 you get the vertext for B'

Score Point 0 (out of 2 points)

Holistically, this response is not sufficient to demonstrate even a limited understanding of the task. Although the coordinates of vertex B are correct, there is no explanation of how they were determined and the dilation is incorrectly performed as a subtraction.

43

Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- A (2,7)
- C (8,1)
- D (2,1)

Square ABCD is dilated by a scale factor of 2 with the center of dilation at the origin, to form square A'B'C'D'. What are the coordinates of vertex B'?

Explain how you determined your answer.

The ansr is B(7,2) be couse it's a square and savares have eqonl sides.

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. The coordinates written are incorrect and the explanation does not address the dilation.

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

HOSE A

Amount of Water (gallons)

```
y
  |
20|
16|
12|
 8|
 4|
  |_____ x
  0  1  2  3
```

Time (minutes)
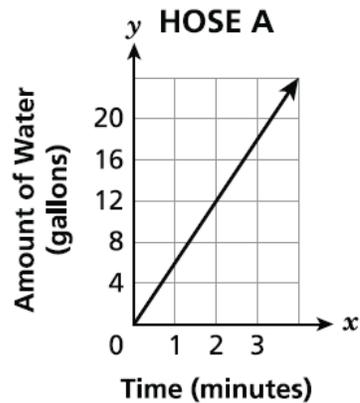
A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?
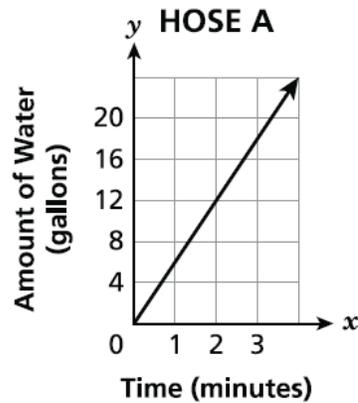
Show your work.

Answer   Hose _____ and _____ gallons per minute

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

HOSE A

Amount of Water (gallons)

20
16
12
8
4
0   1   2   3

Time (minutes)
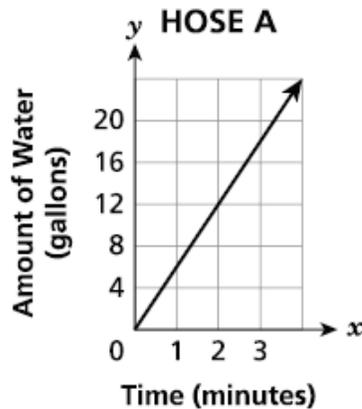
A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Show your work.

Hose A: $\dfrac{12}{2} = 6$ Hose B: $\dfrac{110}{10} = 11$

or other valid process

Answer   Hose _____**B**_____ and _____**11**_____ gallons per minute

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

HOSE A

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Show your work.

Hose A: 12gal/2mins -> 6gal/1min
Hose B: 110gal/10mins -> 11gal/1min
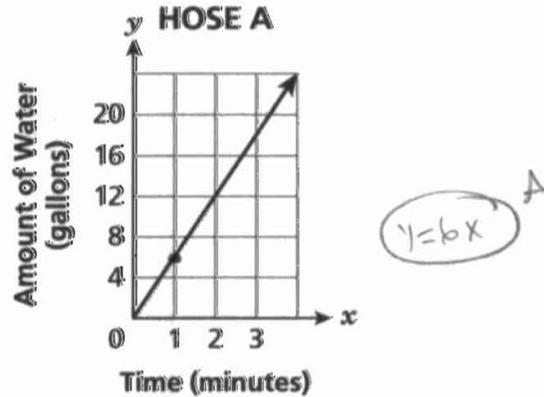
Answer Hose [B] and [11] gallons per minute

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct hose is chosen and the unit rates are calculated correctly using sound procedures.

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

y HOSE A

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Show your work.

B

$$\frac{110}{10} = 11 \text{ gallons per minute}$$

A

$$\frac{24}{4} = 6 \text{ gallons per minute}$$

Answer   Hose __B__ and __11__ gallons per minute

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Show your work.

$$\frac{110}{10} = 11$$

$y = 11x$ B

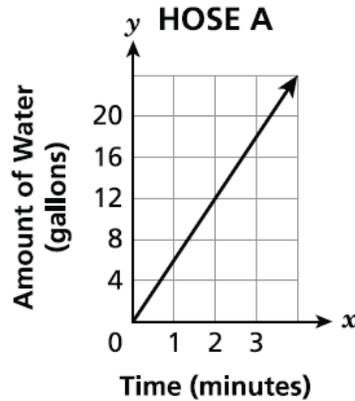*Answer*   Hose _____B_____ and _____11_____ gallons per minute

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct hose is chosen and the unit rates are calculated correctly using sound procedures.

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

HOSE A

Amount of Water (gallons)

y

20
16
12
8
4

0 1 2 3

x

Time (minutes)

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Show your work.

hose A: 12/2=x/10
        x=60

hose B: 110/10

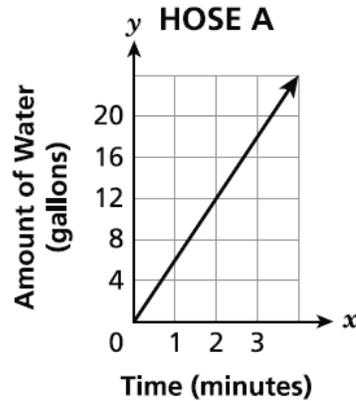*Answer* Hose [**B**] and [**110**] gallons per minute

---

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The correct hose is chosen; however, the work and answer compare the total amount of water after 10 minutes rather than the unit rates. The response addresses only some elements of the task.

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

HOSE A

y

Amount of Water
(gallons)

20
16
12
8
4

0 1 2 3 *x*

Time (minutes)

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Show your work.

$110 \div 10 = 11$
$12 \div 2 = 6$
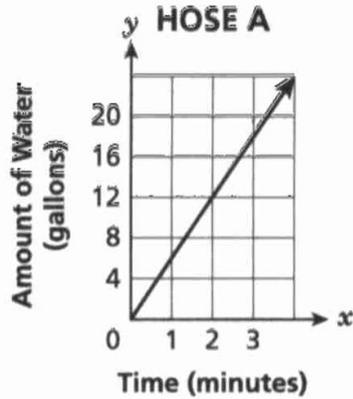
Answer Hose A and 6 gallons per minute

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The unit rates are calculated correctly; however, the wrong hose is chosen as the answer. The response correctly addresses only some elements of the task.

GUIDE PAPER 6

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

y HOSE A

Amount of Water (gallons)

Time (minutes)

$20 y = 3 m$

$6.66 = 1m$

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

$110 = 10m$

$11 = 1m$

Show your work.

$11 = m$

$(11, 1)$

B wins

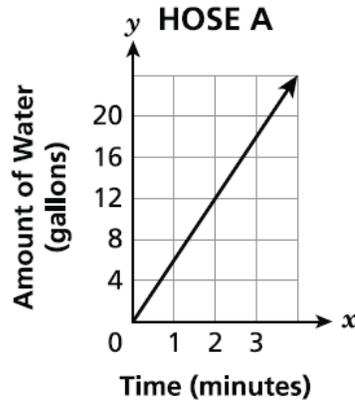**Answer** Hose ___B___ and ___11___ gallons per minute

---

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The correct hose is chosen; however, the unit rate for Hose A is calculated incorrectly. The response correctly addresses only some elements of the task.

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

y **HOSE A**

Amount of Water (gallons)

20
16
12
8
4

0   1   2   3

x

Time (minutes)

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?
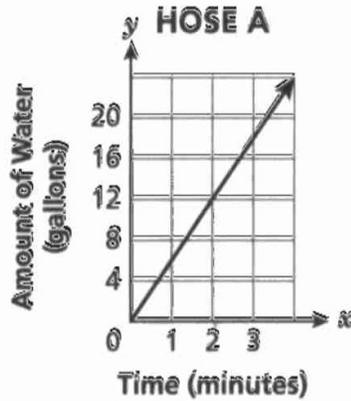
Show your work.

> hose A: 72 gallons in 12 minutes
> hose B: 110 gallons in 10 minutes

Answer   Hose [B]   and   [27.5]   gallons per minute

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Although the correct hose is chosen, the choice is not supported by the work. No calculations are shown and the unit rate for Hose B is incorrect.

44

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.

A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Show your work.

$$
\begin{array}{r}
12,2 \\
12 \quad 2 \\
12 \quad 2 \\
12 \quad 2 \\
+12 \quad 2 \\
\hline
60,0
\end{array}
$$

Answer Hose _____A_____ and _____2_____ gallons per minute

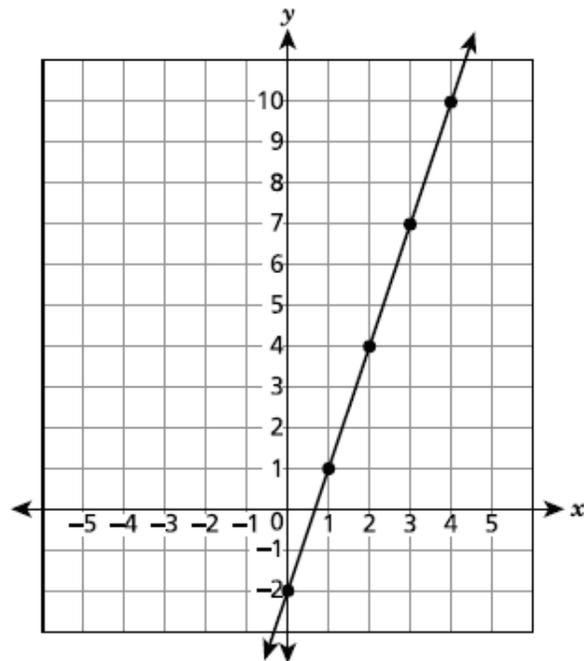## Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. The answer is incorrect and the work only addresses the total amount of water after 10 minutes.

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

_____

_____

_____

45

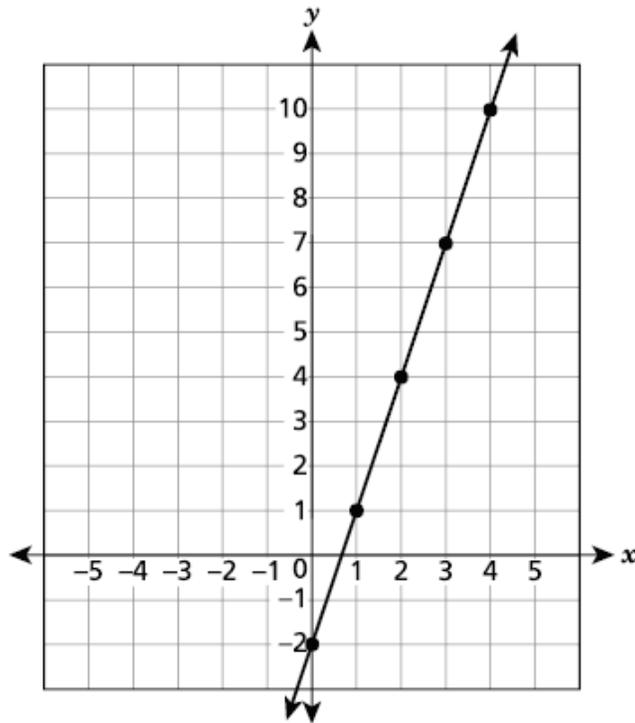The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

For every change of 1 in x, Function A changes by 2 in y. Function B has a slope of 3. Function B has the greater rate of change because $3 > 2$.
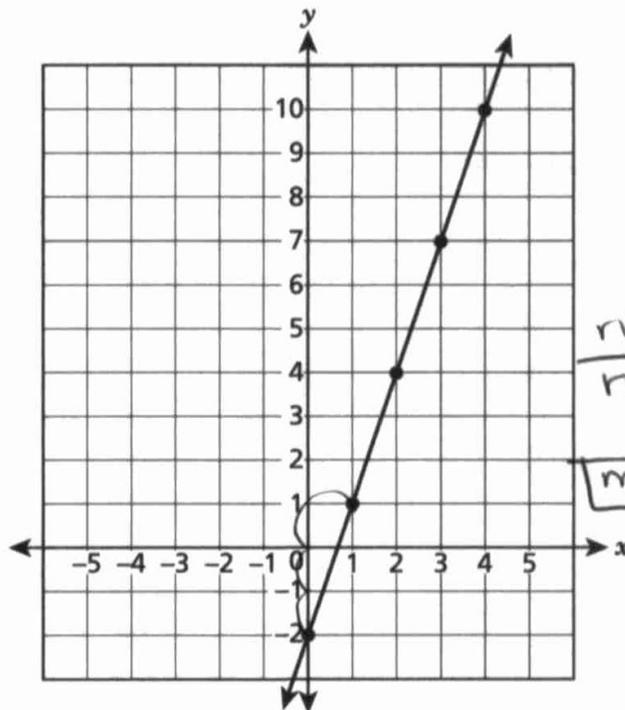
or other valid explanation

45

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

$$m = \frac{\Delta y}{\Delta x}$$

$$m = \frac{2}{1}$$

$$\boxed{m = 2}$$

$$\frac{rise}{run} = \frac{3}{1}$$

$$\boxed{m = 3}$$

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

Function B has a greater rate of change because the slope is 3 which is greater than function A which is 2.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct function is chosen and the correct rates of change are included in the explanation.
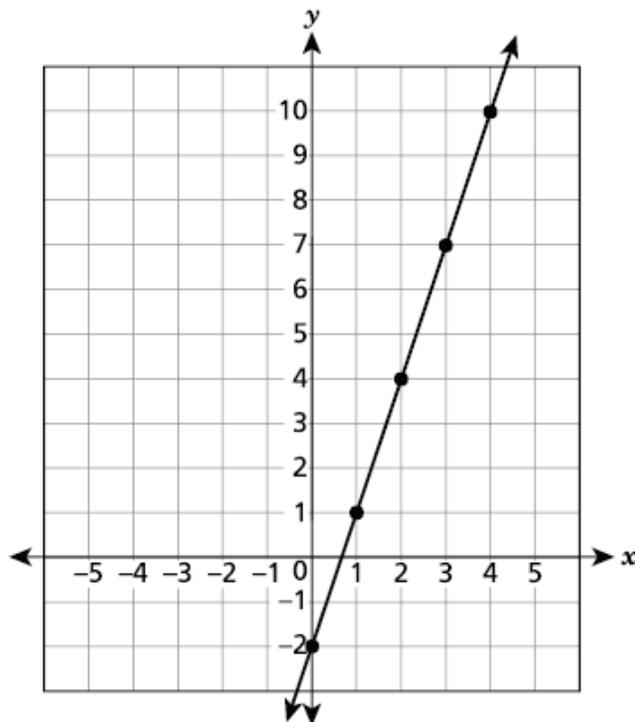
45

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

Function A's Rate of Change$\dfrac{15 - 13}{6 - 5} = 2$

Function B's Rate of Change

$\dfrac{4 - 1}{2 - 1} = 3$

Function B has a greater rate of change because $3 > 2$.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct function is chosen and the correct rates of change are included in the explanation.
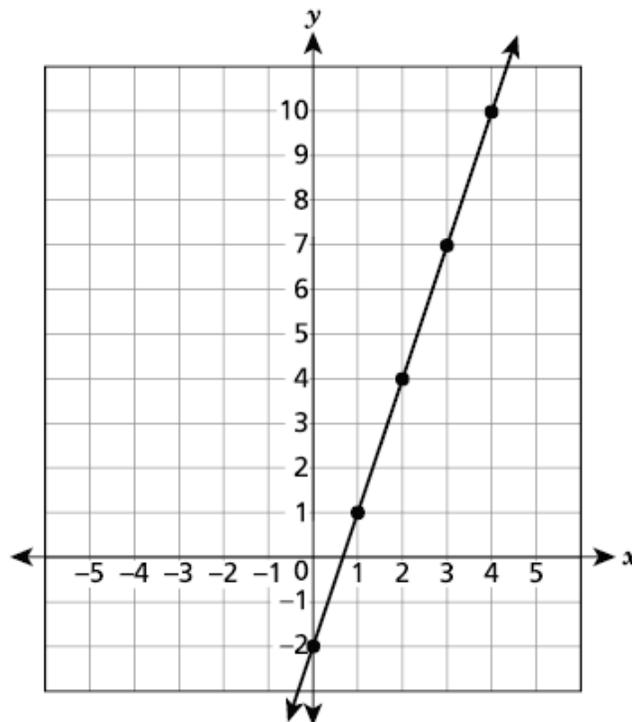
45

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

Function A has a rate of change 2 while Function B has a rate of change of 3, so B has a greater rate of change.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct function is chosen and the correct rates of change are included in the explanation. Per Scoring Policy #4, students are not asked to show work, so work is not required or scored.
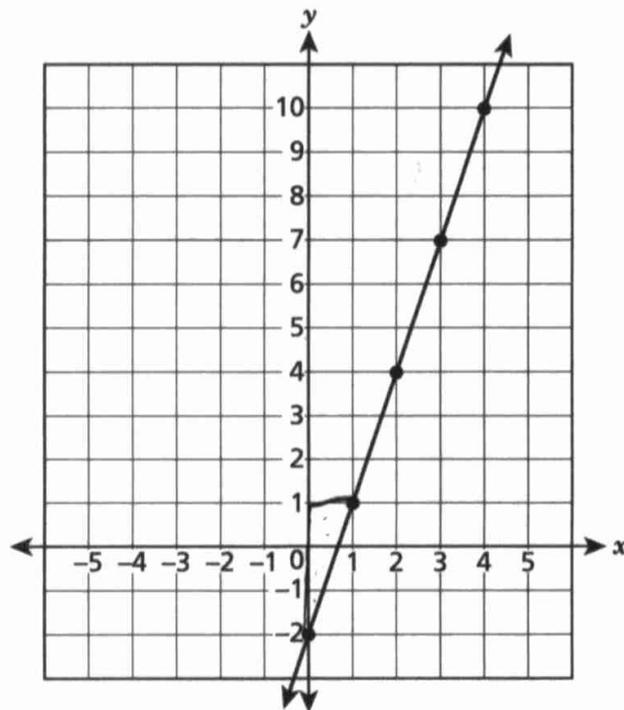
45

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

Function A has a greater rate of change because Function B goes up by 3 and Function A goes up by 5

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The rate of change of Function B is stated correctly; however, the rate of change of Function A is incorrect, leading to an incorrect choice. The response correctly addresses only some elements of the task.
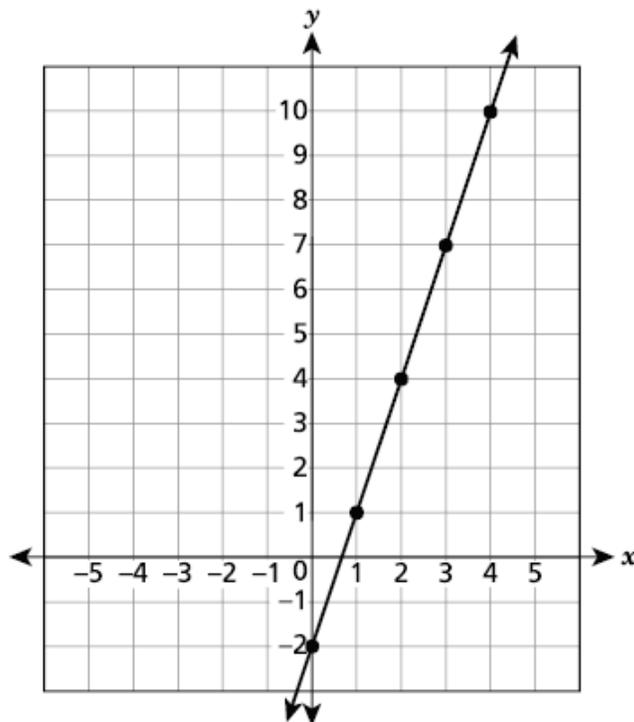
45

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

Function A's Rate of Change is 1/2x
Function B's Rate of Change is 3x

Based on the Constant Rate of change of each equation, Function B has a greater rate of change.
3 is bigger that only 1/2 so that is why I chose B

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The correct function is chosen and the rate of change of Function B is determined correctly; however, the rate of change of Function A is incorrect and both rates are incorrectly stated as including the variable x. The response correctly addresses only some elements of the task.
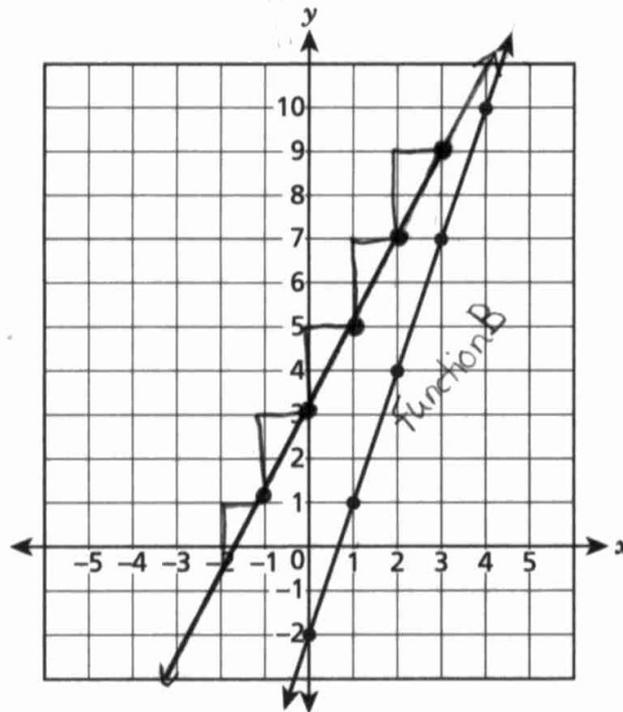
45

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

Function B because it has a steeper slope and will increase faster than function A.

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The correct function is chosen; however, while the explanation is correct, it does not include the values for the rates of change. The response correctly addresses only some elements of the task.
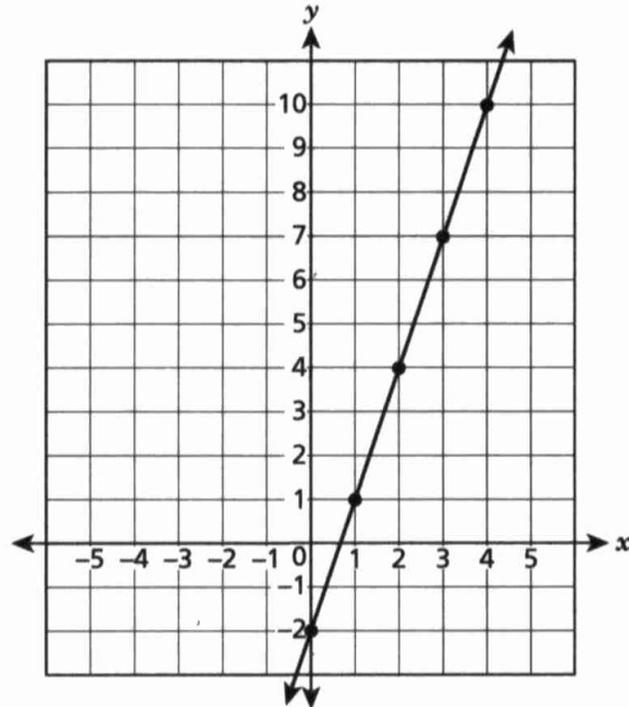
45

The table and graph shown below each represent a function of *x*.

FUNCTION A

x	*y*
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

B has a greater rate

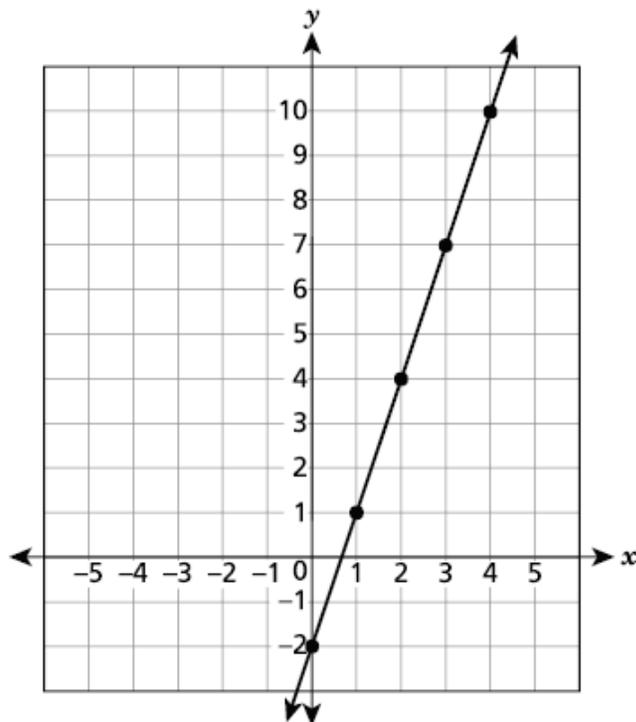## Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Although the correct function is chosen, there is no explanation provided to justify the choice.

45

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B

Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

> Function A has a greater rate of change because it's equation would be y=2x+3 and Function B's is y=3x-2

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Although correct equations are provided for both functions, the explanation does not identify what values in the equations represent the rates of change, and the function chosen is incorrect.

46

The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately $4{,}870{,}000{,}000{,}000{,}000{,}000{,}000{,}000$ kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

Answer _____ kilograms

46

The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately $4{,}870{,}000{,}000{,}000{,}000{,}000{,}000{,}000$ kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$$\text{Mass of Venus} = 4.87 \times 10^{24} \text{ kg}$$

$$\text{Difference} = \text{Mass of Earth} - \text{Mass of Venus}$$
$$= 5.97 \times 10^{24} - 4.87 \times 10^{24}$$
$$= (5.97 - 4.87) \times 10^{24}$$
$$= 1.10 \times 10^{24}$$

or other valid process

Answer _____**1.10×10^{24}**_____ kilograms

46

The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately $4,870,000,000,000,000,000,000,000$ kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$$\frac{\begin{array}{r} 5.97 \times (10)^{24} \\ - \ 4.87 \times (10)^{24} \end{array}}{1.1 \times (10)^{24}}$$

Answer $\boxed{1.1 \times (10)^{24}}$ kilograms

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The difference between the masses is calculated correctly and is correctly expressed in scientific notation.

46

The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately 4,870,000,000,000,000,000,000,000 kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$(5.97 \times 10^{2}4) - (4.87 \times 10^{2}4)$
$= 1.1 \times 10^{2}4$

Answer $\boxed{1.1 \times 10^{2}4}$ kilograms

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The difference between the masses is calculated correctly and is correctly expressed in scientific notation.

46

The mass of Earth is approximately 5.97 × 10²⁴ kilograms. The mass of Venus is approximately 4,870,000,000,000,000,000,000,000 kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

venus ᵐᵃˢˢ 4,870,000,000,000,000,000,000,000)
5.97,00000,0000,00,00,00,00,000

4,870
−5,970
────────   −1.1₀₀

Answer 1.1×10^{24} kilograms

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. The difference between the masses is calculated correctly and is correctly expressed in scientific notation.

46

The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately $4,870,000,000,000,000,000,000,000$ kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$$5.97 \times (10)^{24} - 4.87 \times (10)^{22} = 5.92(10)^{24}$$

Answer $\boxed{5.92 \times (10)^{24}}$ kilograms

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The mass of Venus is converted to scientific notation incorrectly; however, the two values are subtracted correctly. The response contains an incorrect solution but applies an appropriate process.

46

The mass of Earth is approximately 5.97 × 10²⁴ kilograms. The mass of Venus is approximately 4,870,000,000,000,000,000,000,000 kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$$4.8 \times 10^{24}$$
$$5.97 \times 10^{24}$$ } Same exponent

$$5.97 - 4.8 = \boxed{1.17}$$

$$5.97 \times 10^{24}$$
$$- 4.8 \times 10^{24}$$
$$\boxed{1.17 \times 10^{24}}$$

Answer 1.17×10^{24} kilograms

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. Values are correctly subtracted in scientific notation; however, the mass of Venus is truncated to two significant digits, resulting in an incorrect answer. The response contains an incorrect solution but applies an appropriate process.

46

The mass of Earth is approximately 5.97 × 10²⁴ kilograms. The mass of Venus is approximately 4,870,000,000,000,000,000,000,000 kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$$(5.97 \times 10^{24}) - (4.87 \times 10^{24})$$

$$1.1 \times 10^{0}$$

$$1.1 \times 1$$

1.1 Kilograms

Answer __1.1__ kilograms

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. The mass of Venus is correctly converted to scientific notation; however, the exponents are subtracted as well as the coefficients. The response correctly addresses only some elements of the task.

46

The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately 4,870,000,000,000,000,000,000,000 kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$4,872,000,000,000,000,000,000,000$

$$\frac{5.97 \times 10^{24}}{4.87 \times 10^{22}}$$

$$\boxed{1.17 \times 10^{2}}$$

Answer __1.17 X 10²__ kilograms

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. The mass of Venus is converted to scientific notation incorrectly and neither the coefficient nor the exponent of the answer are calculated correctly.

46

The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately 4,870,000,000,000,000,000,000,000 kilograms. What is the difference between the approximate masses, in kilograms, of Earth and Venus? Express your answer in scientific notation.

Show your work.

$5.97 \times (10)^{24} = $ Earth $(5.97^2 4)$
$487^{22} = $ Venus

5,970,000,000,000,000,000,000,000
4,870,000,000,000,000,000,000,000
$= 1100$

Answer $\boxed{1100 = 5.97 \times (10)^{24} - (487)^{22}}$ kilograms

---

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Although the Earth's mass is correctly converted into standard notation, the rest of the work is incorrect and exhibits no overall understanding of scientific notation.

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of x and y?

Show your work.

Answer $x =$ _____

           $y =$ _____

EXEMPLARY RESPONSE

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of x and y?

Show your work.

$$m = \frac{\Delta y}{\Delta x} = \frac{\left(7\frac{3}{4}\right) - \left(6\frac{1}{4}\right)}{\left(1\frac{1}{4}\right) - \left(\frac{3}{4}\right)} = \frac{1\frac{1}{2}}{\frac{1}{2}} = 3$$

$$y = mx + b$$
$$(6.25) = 3(0.75) + b$$
$$6.25 = 2.25 + b$$
$$b = 4$$

$y = 3x + 4$,
substitute any value for x

OR

(x, y) transforms to $\left(x + \frac{1}{2}n, y + 1\frac{1}{2}n\right)$,
using either of the two given points
for any real number n

or other valid process

Any point on the line that is not one of the points provided is a valid answer, including but not limited to: $(0, 4), (1, 7)$, and $\left(1\frac{3}{4}, 9\frac{1}{4}\right)$.

Answer $x =$ ___Any value of x, such that $x \neq \frac{3}{4}$ and $x \neq 1\frac{1}{4}$.___

$y =$ ___Any value of y such that it satisfies $y = 3x + 4$ for the chosen value of x.___

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of *x* and *y*?

Show your work.

1 1/4 - 3/4 = 1/2
7 3/4 - 6 1/4 = 1 1/2

1 1/4 + 1/2 = 1 3/4
7 3/4 + 1 1/2 = 9 1/4

Answer x = $1\frac{3}{4}$ y = $9\frac{1}{4}$

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. Correct values for *x* and *y* are determined using an appropriate procedure.

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of x and y?

Show your work.

$y = mx + b$

$m = \dfrac{\Delta y}{\Delta x}$

$m = \dfrac{7\frac{3}{4} - 6\frac{1}{4}}{1\frac{1}{4} - \frac{3}{4}}$

$m = \dfrac{1\frac{1}{2}}{\frac{1}{2}}$

$m = 3$

$y = 3x + b$

$6\frac{1}{4} = 3\left(\frac{3}{4}\right) + b$

$6\frac{1}{4} = 2\frac{1}{4} + b$

$b = 4$

$y = 3x + 4$

$x = 1$

$y = 3(1) + 4$

$y = 7$

Answer x = _____1_____   y = _____7_____

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. Correct values for *x* and *y* are determined using an appropriate procedure.

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of x and y?

Show your work.

$6\frac{1}{4} \quad \frac{25}{4} \quad 7\frac{3}{4} \quad \frac{31}{4} \quad \frac{31}{4} - \frac{25}{4} = \frac{6}{4}$

$\left(\frac{3}{4}, \frac{25}{4}\right), \left(\frac{5}{4}, \frac{31}{4}\right)$ Change of y

$\frac{5}{4} - \frac{3}{4} = \frac{2}{4}$ ← Change of x

$(x, y) \rightarrow \left(1\frac{3}{4}, 9\frac{1}{4}\right)$

Answer x = $1\frac{3}{4}$ y = $9\frac{1}{4}$

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the concepts in the task. Correct values for *x* and *y* are determined using an appropriate procedure.

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of *x* and *y*?

Show your work.

$\$0.75 - 1.25 = \cancel{\$0.50} .50$ So $X = \cancel{\$} 1\frac{3}{4}$

$6.25 - 7.75 = 1.5$ So $y = 9\frac{1}{4}$

Answer $x = $ _____ $1\frac{3}{4}$ _____ $y = $ _____ $9\frac{1}{4}$ _____

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. Correct values of *x* and *y* are determined. However, as written, the subtractions to determine the changes in *x* and *y* are incorrect: the resulting values should be negative. The response correctly addresses only some elements of the task.

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of x and y?

Show your work.

x	y
$\frac{3}{4}$	$6\frac{1}{4}$
$1\frac{1}{4}$	$7\frac{3}{4}$
x	y_1

$slope = \frac{y^2 - y^1}{x^2 - x^1}$

$\frac{7\frac{3}{4} - 6\frac{1}{4}}{1\frac{1}{4} - \frac{3}{4}} = \frac{1\frac{1}{2}}{\frac{3}{4}} = \frac{3}{4}$

$slope = 2$

$y = 2x + 4\frac{3}{4}$

Answer $x =$ _____ 0 _____ $y =$ _____ $4\frac{3}{4}$ _____

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. A calculation error occurs in the denominator when determining the slope of the line ($1\frac{1}{4} - \frac{3}{4} = \frac{3}{4}$). Although the equation representing the line is incorrect, the values of x and y do satisfy this equation. The response contains an incorrect solution but applies an appropriate process.

47

The ordered pairs below represent a linear function.

$$\underset{x_1 \quad y_1}{\left(\frac{3}{4}, 6\frac{1}{4}\right)}, \underset{x_2 \quad y_2}{\left(1\frac{1}{4}, 7\frac{3}{4}\right)}, (x, y)$$

Which values could be the values of x and y?

Show your work.

$6\frac{1}{4} = \frac{25}{4}$ $7\frac{3}{4} = \frac{31}{4} - \frac{25}{4}$ $= \frac{\frac{6}{4}}{\frac{2}{4}} = 3$

$1\frac{1}{4} = \frac{5}{4}$ $\dfrac{\frac{5}{4} - \frac{3}{4}}{}$

$\dfrac{y}{x} = \dfrac{\frac{6}{4}}{\frac{2}{4}}$

$\frac{6}{4} \div \frac{2}{4} = \frac{6}{4} \times \frac{4}{2} = \frac{24}{8} = 3$

$7\frac{3}{4} + \frac{6}{4} = \frac{9}{4}$

Answer $x = \underline{\quad 1\frac{3}{4} \quad}$ $y = \underline{\quad 8\frac{3}{4} \quad}$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the concepts in the task. A correct value of x is determined; however, the value of y is incorrect due to a calculation error. The response contains an incorrect solution but applies an appropriate process.

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of *x* and *y*?

Show your work.

$7\frac{3}{4} - 1\frac{1}{4} = 5$

$1\frac{1}{4} + \frac{1}{2} = .75$ or $\frac{75}{100}$ or $\frac{3}{4}$

$\frac{15}{20} \quad \frac{3}{4}$

Answer x = $1\frac{3}{4}$ y = $9\frac{1}{4}$

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Although correct values of *x* and *y* are provided, the work is incorrect and does not support the solution.

47

The ordered pairs below represent a linear function.

$$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$$

Which values could be the values of *x* and *y*?

Show your work.

$m = \dfrac{Y^2 - Y^1}{X^2 - X^1}$ $m = \dfrac{1\frac{1}{4} - \frac{3}{4}}{7\frac{3}{4} - 6\frac{1}{4}}$ $\frac{1}{2}$ $1\frac{1}{2}$

Answer x = $\dfrac{1}{2}$ y = $1\dfrac{1}{2}$

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the task. Determining the slope and/or changes in *x* and *y* alone is not enough of the process to address the task of using that information to determine a third point on the line.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.

- Each van transported a total of 12 students and teachers.

- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses? What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

Answer _____ students and teachers rode in buses

_____ students and teachers rode in vans

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.

- Each van transported a total of 12 students and teachers.

- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

b = number of buses
v = number of vans

$55b + 12v = 409$ people in buses:
$b - v = 5$ $7 \times 55 = 385$

$55b + 12v = 409$ people in vans:
$12(b - v) = 12(5)$ $2 \times 12 = 24$

$55b + 12v = 409$ $(385 + 24 = 409)$
$12b - 12v = 60$ *or other valid process*

$67b = 469$ $v = b - 5$
$b = 7$ $v = 7 - 5$
             $v = 2$

Answer   _____**385**_____ students and teachers rode in buses

            _____**24**_____ students and teachers rode in vans

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

let
bus = x
van = y

$55x + 12y = 409$

$x = 5 + y$

$55(5+y) + 12y = 409$
$275 + 55y + 12y = 409$
$275 + 67y = 409$
$-275 \qquad -275$

$\dfrac{67y}{67} = \dfrac{134}{67}$

$\boxed{y = 2}$

$x = 5 + y$

$5 + 2$

$\boxed{x = 7}$

$x = 55(7)$
$y = 12(2)$

$x = 385$
$y = 24$

Answer __385__ students and teachers rode in buses

__24__ students and teachers rode in vans

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct solution is calculated by solving an appropriate system of equations.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$$55 \times 7 = 385$$

$$12 + 12 = 24$$

$$55 \times 7 = 385$$

$$55 \times 8 = 440$$

$$55 \times 7 = 385$$

$$55 \times 6 = 330$$

Answer ___385___ students and teachers rode in buses

___24___ students and teachers rode in vans

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct solution is calculated using trial-and-error.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$$55b + 12v = 409 \qquad v+5=b$$
$$55b+12(b-5)=409 \qquad -5$$
$$55b+12b-60=409 \qquad v=b-5$$
$$67b-60=409$$
$$+60 \qquad\qquad v+5=7$$
$$\frac{67b}{67}=\frac{469}{67} \qquad \frac{-5 \quad -5}{v=2}$$
$$b=7$$

Answer ___385___ students and teachers rode in buses

___24___ students and teachers rode in vans

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the concepts in the task. The correct solution is calculated by solving an appropriate system of equations.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$v + 5 = b$

$55b + 12v = 409$

$55(v+5) + 12v = 409$

$55v + 275 + 12v = 409$

$67v + 275 = 409$

$67v = 134$

$v = 2$

$$
\begin{array}{r}
55 \\
55 \\
55 \\
55 \\
55 \\
55 \\
55 \\
+ \quad 12 \\
\hline
342
\end{array}
$$

Answer ___385___ students and teachers rode in buses

___24___ students and teachers rode in vans

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the concepts in the task. An appropriate system of equations is solved to determine the number of vans; however, the work does not show how this result was used to calculate the correct solution. The response addresses most, but not all aspects of the task.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$$55(5 + v) + 12v = 409$$
$$275 + 55v + 12v = 409$$
$$67v = 134$$
$$v = 2$$

Answer _____7_____ students and teachers rode in buses

_____2_____ students and teachers rode in vans

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the concepts in the task. An appropriate equation is solved to determine the number of vans; however, the number of buses and vans is entered as the solution rather than the number of students and teachers that rode in them. The response addresses most, but not all aspects of the task.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.

- Each van transported a total of 12 students and teachers.

- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$55b + 12v = 409$

$b - 5 = v$

$+5 \quad +5$

$b = v + 5$

$55(v + 5) + 12 = 409$

$55v + 275 + 12 = 409$

$55v + 287 = 409$

$\dfrac{55v}{55} = \dfrac{122}{55}$

$v = 2.21$

$7 \times 55 = 385$ $\qquad 2 \times 12 = 24$

Answer ___385___ students and teachers rode in buses

___24___ students and teachers rode in vans

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the concepts in the task. An appropriate system of equations is solved to determine the number of vans; however, a transcription error occurs during the process (the variable *v* is dropped from the term 12*v*), leading to the incorrect solution *v* = 2.21, which is then truncated to a whole number. The response reflects some minor misunderstanding of the underlying procedure.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

Check & guess
① 7 buses = 385 5's T
2 vans = 24 5's T
409

Answer ___385___ students and teachers rode in buses

___24___ students and teachers rode in vans

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the concepts in the task. Although the solution is correct, the required work is limited and does not fully show what operations were performed to obtain the values.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$$4409 = x + y$$
$$y = x + 5$$

$$4409 = x + (x + 5)$$
$$409 = 2x + 5$$
$$404 = 2x$$
$$\frac{404}{2} = \frac{2x}{2}$$
$$202 = x$$
$$x = 2$$

let
Vans = x
buses = (

$$y = 202 + 5$$
$$y = 207$$

Answer ___207___ students and teachers rode in buses

___202___ students and teachers rode in vans

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the concepts in the task. The system of equations written to represent the problem is incorrect; however, the system is solved correctly to determine the values of *x* and *y*. The response addresses some elements of the task correctly but reaches an inadequate solution.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$b55 + v12 = 409$

$$55\overline{)409} \quad 7$$
$$385$$
$$24$$

$$12\overline{)24} \quad 2$$

Answer _____7_____ students and teachers rode in buses

_____2_____ students and teachers rode in vans

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the concepts in the task. Only one correct equation is written to represent the problem. Although the correct number of buses and vans is calculated, the procedure is not entirely correct: the division 409 ÷ 55 implicitly assumes the maximum number of buses was used, which does not adhere a priori to the three bulleted conditions listed in the prompt. The response exhibits multiple flaws in reasoning.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.

- Each van transported a total of 12 students and teachers.

- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$$55x + 12(y+5) = 409$$
$$55x + 60 + 12y = 409$$
$$-60 \quad \quad -60$$
$$55x + 12y = 349$$

Answer ___5___ students and teachers rode in buses

___6___ students and teachers rode in vans

Score Point 0 (out of 3 points)

This response is not sufficient to demonstrate even a limited understanding of the task. The equation written to represent the problem is incorrect. The answer is incorrect and does not follow from the work.

48

A school district transported a total of 409 students and teachers to a zoo in buses and vans.

- Each bus transported a total of 55 students and teachers.
- Each van transported a total of 12 students and teachers.
- There were 5 more buses than vans.

What is the total number of students and teachers who rode to the zoo in buses?
What is the total number of students and teachers who rode to the zoo in vans?

Show your work.

$$55 - 12 = \boxed{47}$$

12 students + teachers rode van

55 total students and teachers

Answer ____47____ students and teachers rode in buses

____12____ students and teachers rode in vans

Score Point 0 (out of 3 points)

This response is not sufficient to demonstrate even a limited understanding of the task. The work and solution are incorrect.