New York NYSTP 2018 Grade 8 Math

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Grade 8 Mathematics Reference Sheet

CONVERSIONS

1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 5,280 feet
1 mile = 1,760 yards
1 mile = 1.609 kilometers

1 kilometer = 0.62 mile
1 pound = 16 ounces
1 pound = 0.454 kilogram
1 kilogram = 2.2 pounds
1 ton = 2,000 pounds

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
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	$a^2 + b^2 = c^2$

Name: _____

New York State Testing Program

2018 Mathematics Test Session 1

Grade 8

May 1–3, 2018

Released Questions

Session 1

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before making your choice.
- You have been provided with mathematics tools (a ruler, a protractor, and a calculator) and a reference sheet to use during the test. It is up to you to decide when each tool and the reference sheet will be helpful. You should use mathematics tools and the reference sheet whenever you think they will help you to answer the question.

1 In each table, x represents the input value and y represents the output value. Which table does **not** represent a function of x?

A

x	y
0	0
1	1
2	2
3	3

B

x	y
3	0
2	1
1	2
0	3

C

x	y
0	3
1	3
2	3
3	3

D

x	y
3	0
3	1
3	2
3	3

2 City X has a population of 3×10^5 and City Y has a population of 6×10^6. Which statement correctly describes the relationship between the populations of City X and City Y?

A The population of City Y is 2 times the population of City X.

B The population of City Y is 20 times the population of City X.

C The population of City X is $300{,}000$ less than the population of City Y.

D The population of City X is $3{,}000{,}000$ less than the population of City Y.

3 Which equation describes a linear function?

A $V = s^3$

B $y = \left(\frac{1}{6}\right)x$

C $y = (2)^x$

D $A = \pi r^2$

4 A system of equations is shown below.

$$5x + 2y = -15$$
$$2x - 2y = -6$$

What is the solution to the system of equations?

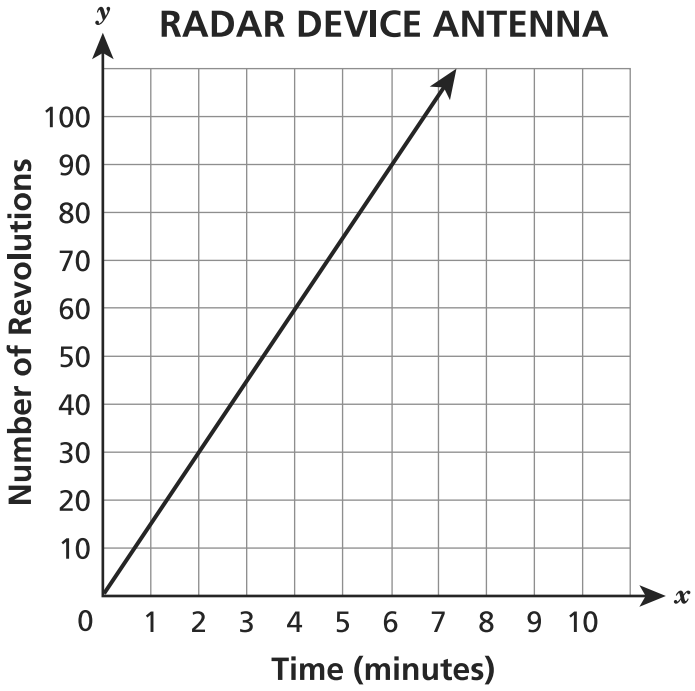
A $(-3, 0)$

B $(0, -3)$

C $(-3, 6)$

D $(6, -3)$

6 A radar device has an antenna that revolves at a constant rate. The graph shows the number of revolutions the device will make over time.



Which table shows the data for an antenna that revolves at exactly twice the rate of the antenna described in the graph?

A

ANTENNA #1

Time (minutes)	Number of Revolutions
15	315
30	660

B

ANTENNA #2

Time (minutes)	Number of Revolutions
18	450
36	900

C

ANTENNA #3

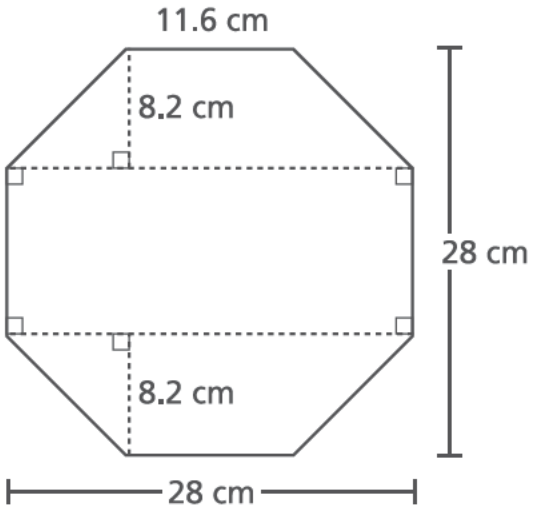
Time (minutes)	Number of Revolutions
20	40
25	50

D

ANTENNA #4

Time (minutes)	Number of Revolutions
22	660
24	720

7 The octagon shown below has eight congruent sides. The given measures of the octagon are rounded to the nearest tenth of a centimeter.



What is the area, to the nearest square centimeter, of the octagon?

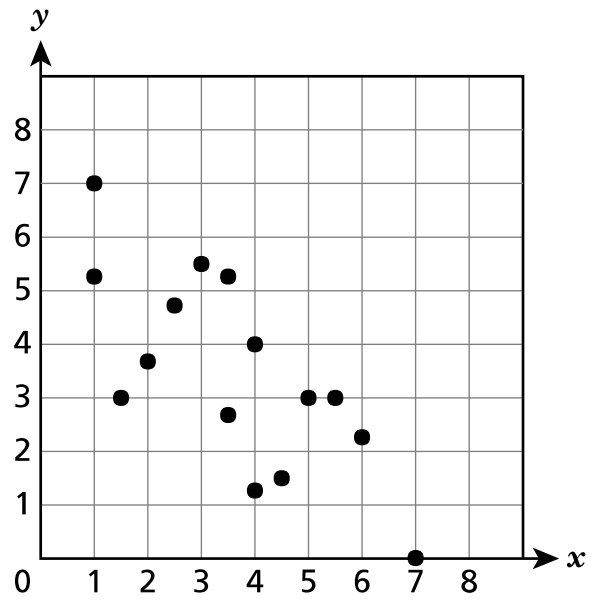
A 392

B 487

C 650

D 720

8 A set of data is represented on the scatter plot below.



Which equation **best** models the set of data?

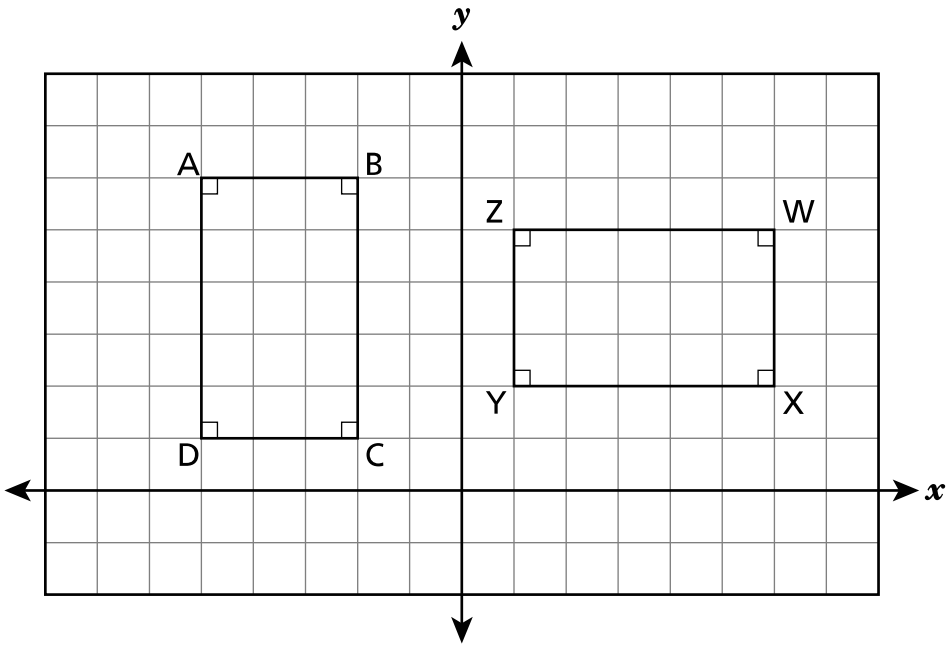
A $y = -\frac{3}{4}x + 6$

B $y = \frac{3}{4}x - 6$

C $y = -6x + \frac{3}{4}$

D $y = 6x - \frac{3}{4}$

11 On the coordinate plane below, rectangle $ABCD$ is rotated $90°$ clockwise about the origin to form rectangle $WXYZ$.



Which statement about the relationship between rectangle $ABCD$ and rectangle $WXYZ$ is true?

A $\overline{DA} \cong \overline{YZ}$

B $\overline{DC} \cong \overline{XY}$

C $\overline{BC} \cong \overline{YZ}$

D $\overline{AB} \cong \overline{WX}$

14 Which set of ordered pairs (x, y) could represent a linear function of x?

A $\{(-2, 8),\ (0, 4),\ (2, 3),\ (4, 2)\}$

B $\{(1, 2),\ (1, 3),\ (1, 4),\ (1, 5)\}$

C $\{(-2, 7),\ (0, 12),\ (2, 17),\ (4, 22)\}$

D $\{(3, 5),\ (4, 7),\ (3, 9),\ (5, 11)\}$

15 Which set of angle measures could be the interior angles of a triangle?

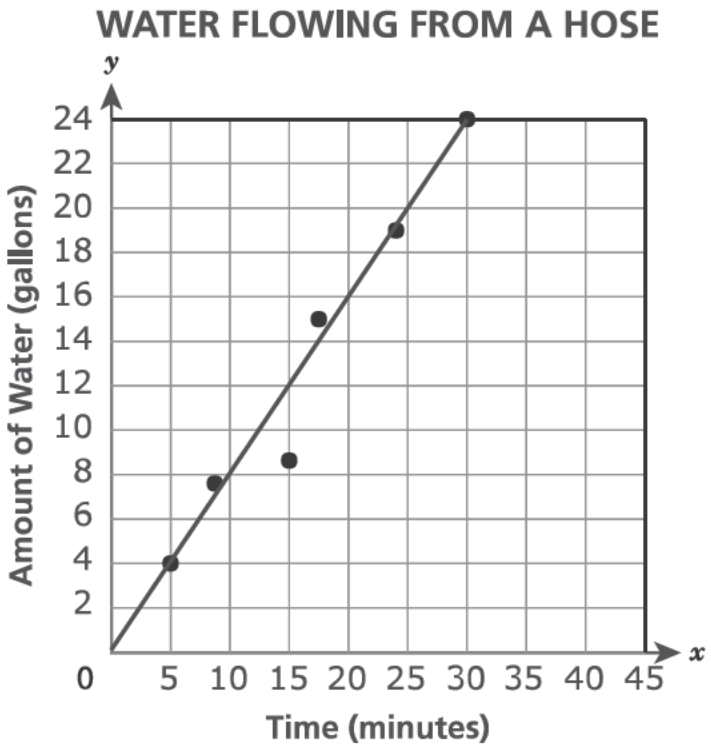
A $90°,\ 90°,\ 90°$

B $80°,\ 80°,\ 200°$

C $40°,\ 50°,\ 60°$

D $15°,\ 30°,\ 135°$

16 The scatter plot below can be used to find the approximate rate at which water flows through a garden hose. The line of best fit for the scatter plot can be described by the equation $y = \frac{4}{5}x$.



If the rate, in gallons per minute, continues, approximately how many gallons of water will flow from the hose in 45 minutes?

A 24

B 36

C 39

D 56

GO ON

19 Functions W and Z are both linear functions of x.

Function W

$$y = -\frac{1}{16}x + 30$$

Function Z

x	0	1	2	3
y	15.8	15.76	15.72	15.68

Which statement comparing the functions is true?

A The slope of Function W is equal to the slope of Function Z.

B The slope of Function W is less than the slope of Function Z.

C The *y*-intercept of Function W is equal to the *y*-intercept of Function Z.

D The *y*-intercept of Function W is less than the *y*-intercept of Function Z.

20 On a coordinate plane, vertex A for triangle ABC is located at $(6, 4)$. Triangle ABC is dilated by a scale factor of 0.5 with the center of dilation at the origin. The resulting image is triangle $\mathrm{A'B'C'}$. What are the coordinates of vertex $\mathrm{A'}$?

A $(3, 2)$

B $(12, 8)$

C $(5.5, 3.5)$

D $(6.5, 4.5)$

23 Triangle BCD is rotated $180°$ clockwise and then dilated by a factor of 4 centered at the origin. The resulting image is triangle $B'C'D'$. Which statement about the two triangles is true?

A The area of $\triangle BCD$ is 4 times the area of $\triangle B'C'D'$.

B The perimeter of $\triangle BCD$ is 4 times the perimeter of $\triangle B'C'D'$.

C The corresponding sides of $\triangle BCD$ and $\triangle B'C'D'$ are congruent.

D The corresponding angles of $\triangle BCD$ and $\triangle B'C'D'$ are congruent.

24 At a local basketball game, all tickets are the same price and all souvenirs are the same price. Mr. Smith bought 2 tickets to this basketball game and 1 souvenir for a total of $17.25. Ms. Lockhart bought 5 tickets to the same game and 2 souvenirs for a total of $42.00. How much was a ticket to this game?

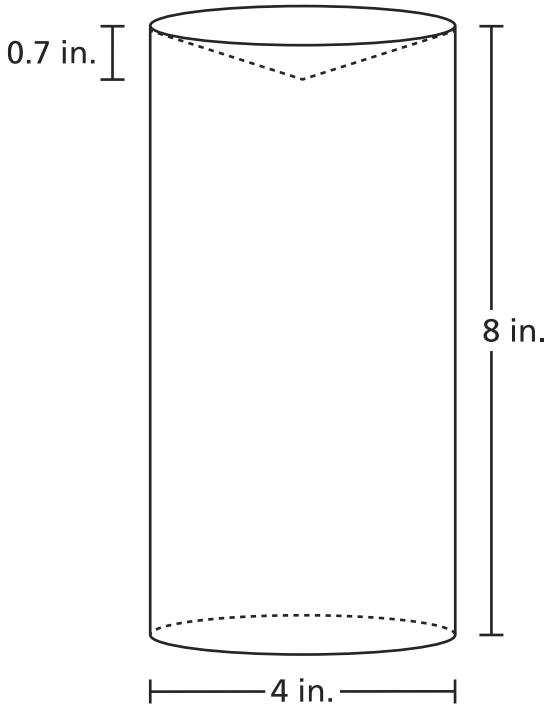
A $2.25

B $7.50

C $8.50

D $9.75

26 The object below is made of solid plastic. It is a cylinder with an indentation at the top in the shape of a cone.



What is the volume, to the nearest tenth of a cubic inch, of the plastic object?

A 103.5

B 100.4

C 97.6

D 91.7

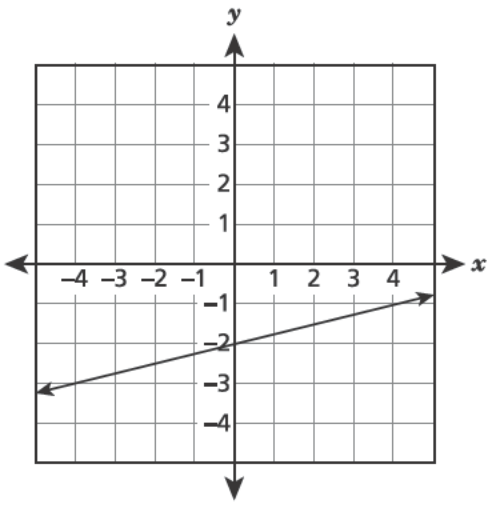
GO ON

30 Which function of x has the **least** value for the y-intercept?

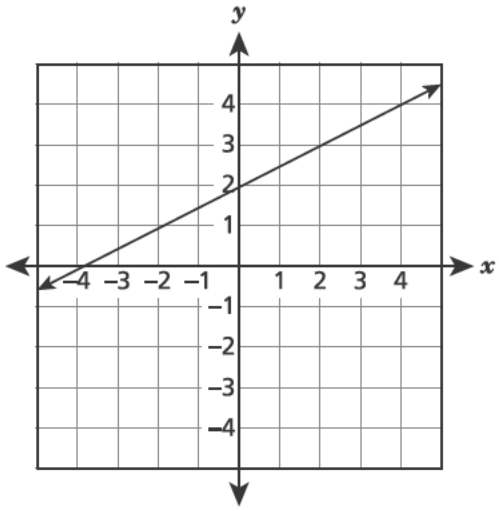
A $y = -4x + 15$

C $y = 2x - 3$

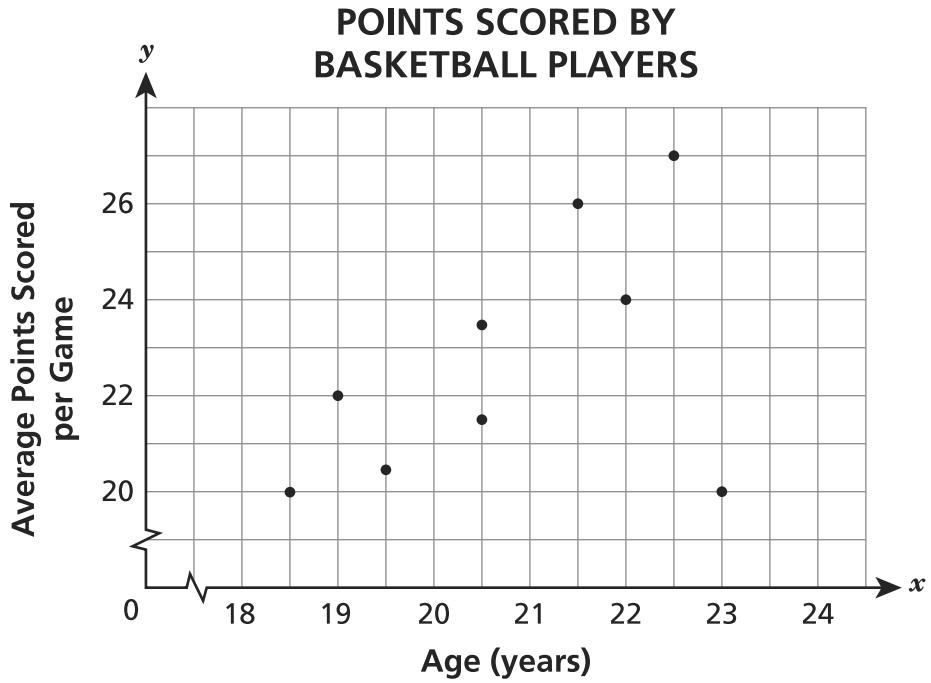
B



D



31 The scatter plot below shows the average points scored per game by players of different ages in an adult basketball league.



Which statement **best** describes the association between a player's age, in years, and the average points scored per game?

A There is no association.

B There is a nonlinear association.

C There is a positive linear association and one outlier.

D There is a negative linear association and one outlier.

32 In city W, the average cost for a gym membership is given by the equation $y = 34.99x + 49$, where y is the total cost, in dollars, for x months of membership. What is the meaning of the y-value when $x = 1$?

A the average sign-up fee for a gym membership

B the average monthly charge for a gym membership

C the average total cost for the first month of a gym membership

D the average total cost for the first two months of a gym membership

33 What is the volume, in terms of π, for a cylindrical container with a radius of 3.25 centimeters and a height of 10 centimeters?

A $65\pi \text{ cm}^3$

B $105.625\pi \text{ cm}^3$

C $331.83\pi \text{ cm}^3$

D $422.5\pi \text{ cm}^3$

STOP

Session 2

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before making your choice or writing your response.
- You have been provided with mathematics tools (a ruler, a protractor, and a calculator) and a reference sheet to use during the test. It is up to you to decide when each tool and the reference sheet will be helpful. You should use mathematics tools and the reference sheet whenever you think they will help you to answer the question.
- Be sure to show your work when asked.

34 Kevin and Christy both saved money for their class trip. Kevin saved the same amount each week. The total amount that Kevin saved at the end of every two weeks is shown in the table below.

KEVIN'S SAVINGS

Time (weeks)	Total Amount Saved
2	$46
4	$92
6	$138

Christy's savings can be modeled by the equation $y = 26x$, where y is the total amount of money saved in x weeks. Which statement correctly compares the rates at which Kevin and Christy saved money?

A Christy saved $\$3$ per week more than Kevin.

B Kevin saved $\$10$ per week more than Christy.

C Christy saved $\$18$ per week more than Kevin.

D Kevin saved $\$20$ per week more than Christy.

35 The points $(4, 1)$ and $(x, -6)$ lie on the same line. If the slope of the line is 1, what is the value of x?

A $x = -3$

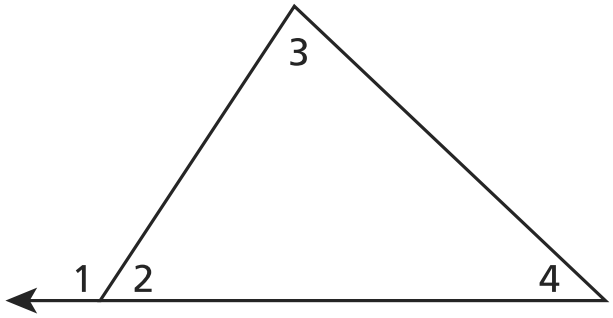
B $x = 3$

C $x = 9$

D $x = 11$

GO ON

36 Mya claims $(m\angle 3 + m\angle 4) = m\angle 1$, as shown in the triangle below.



Which equations explain why Mya's claim must be true?

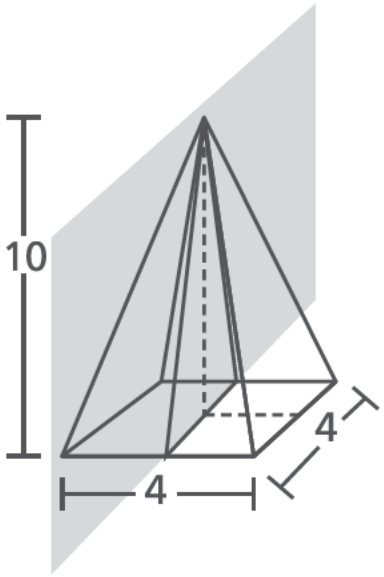
A $(m\angle 1 + m\angle 2) = 90^\circ$ and $(m\angle 3 + m\angle 4) = 90^\circ$

B $(m\angle 1 + m\angle 2) = 180^\circ$ and $(m\angle 3 + m\angle 4) = 180^\circ$

C $(m\angle 1 + m\angle 2) = 90^\circ$ and $(m\angle 3 + m\angle 4 + m\angle 2) = 90^\circ$

D $(m\angle 1 + m\angle 2) = 180^\circ$ and $(m\angle 3 + m\angle 4 + m\angle 2) = 180^\circ$

37 The dimensions of a square right pyramid are shown below.



The pyramid is sliced by a plane that passes vertically through the top vertex and is perpendicular to the base. What is the resulting two-dimensional shape and the area of the plane section?

A a triangle with an area of 20 square units

B a triangle with an area of 40 square units

C a rectangle with an area of 16 square units

D a rectangle with an area of 40 square units

38 A newspaper conducted a survey to find out how many high school students play video games. The two-way table below displays the data from the survey.

VIDEO GAME SURVEY

	Boys	Girls	Total
Do Play Video Games	1,593	1,361	2,954
Do Not Play Video Games	858	1,635	2,493
Total	2,451	2,996	5,447

Based on these data in the table, which statement is true?

A There were 2,451 boys surveyed, and about 29% of them play video games.

B There were 2,996 girls surveyed, and about 45% of them play video games.

C There were 5,447 students surveyed, and about 54% of them do not play video games.

D There were 2,493 students surveyed, and about 34% of them are girls who do not play video games.

39 Two cells are viewed and measured under a microscope. The approximate diameter of each cell is listed below.

- cell P: 5.0×10^{-4} meters
- cell Q: 3.0×10^{-5} meters

What is the approximate difference, in meters, between the diameter of cell P and the diameter of cell Q ?

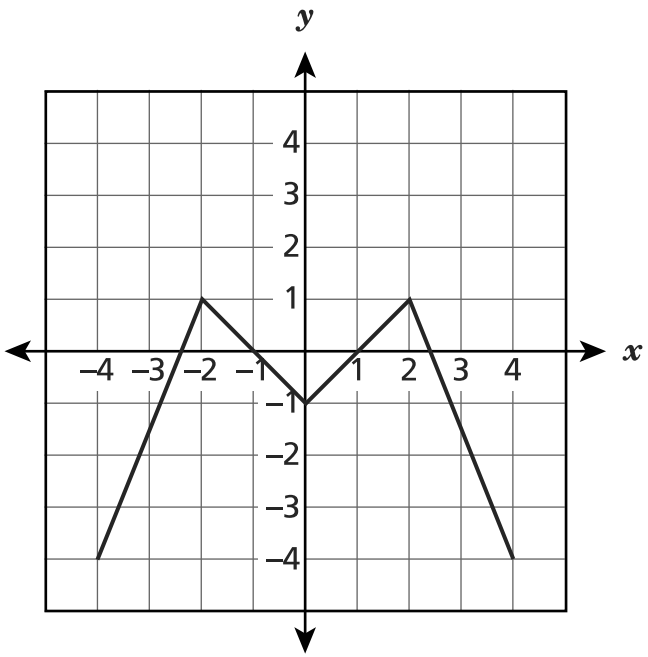
A 2.0×10^{-5}

B 2.0×10^{-4}

C 4.7×10^{-5}

D 4.7×10^{-4}

40 A function of x is shown on the coordinate plane.



Over which intervals is the function increasing?

A $-4 < x < -2$ and $-1 < x < 1$

B $-4 < x < -2$ and $0 < x < 2$

C $-2 < x < 0$ and $2 < x < 4$

D $-2 < x < -1$ and $2 < x < 4$

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) _____

GO ON

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

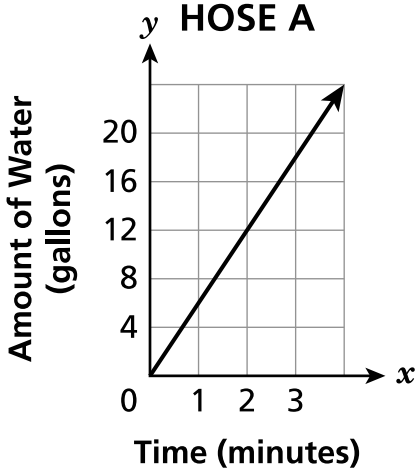
43 Square $ABCD$ is located on a coordinate plane. The coordinates for three of the vertices are listed below.

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

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.

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.

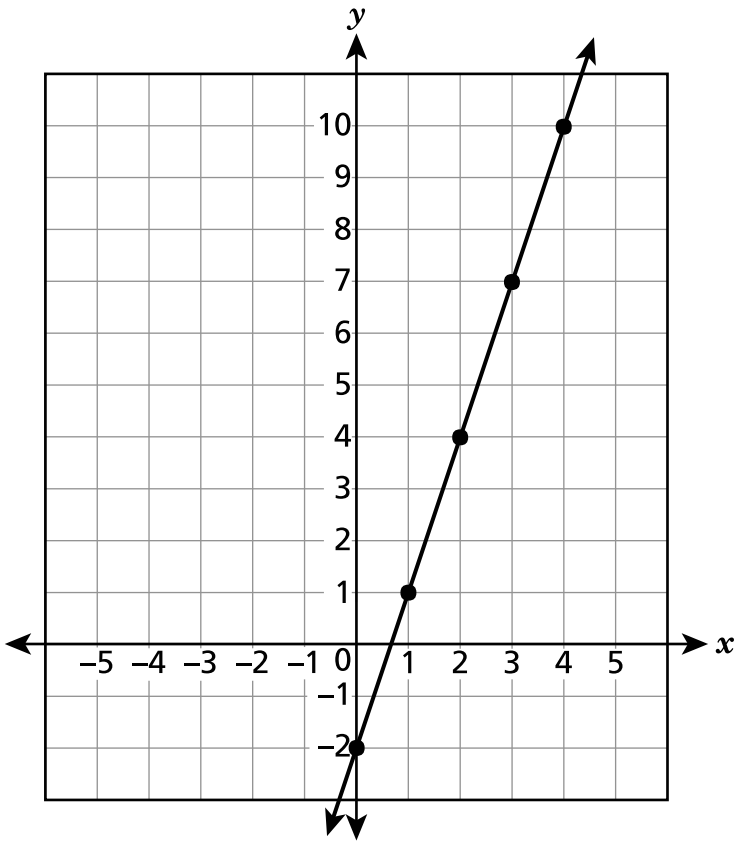
Answer Hose _____ and _____ gallons per minute

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.

46 The mass of Earth is approximately 5.97×10^{24} kilograms. The mass of Venus is approximately $4{,}870{,}000{,}000{,}000{,}000{,}000{,}000$ 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

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.

Answer $x =$ _____

$y =$ _____

GO ON

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

STOP

THE STATE EDUCATION DEPARTMENT

THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234

2018 Mathematics Tests Map to the Standards

Grade 8 Released Questions on EngageNY

Question	Type	Key	Points	Standard	Cluster	Multiple Choice Questions:	Constructed Response Questions:	
						Percentage of Students Who Answered Correctly (P-Value)	Average Points Earned	P-Value (Average Points Earned ÷ Total Possible Points)
Session 1								
1	Multiple Choice	D	1	CCSS.Math.Content.8.F.A.1	Functions	0.72		
2	Multiple Choice	B	1	CCSS.Math.Content.8.EE.A.3	Expressions and Equations	0.64		
3	Multiple Choice	B	1	CCSS.Math.Content.8.F.A.3	Functions	0.68		
4	Multiple Choice	A	1	CCSS.Math.Content.8.EE.C.8b	Expressions and Equations	0.67		
6	Multiple Choice	D	1	CCSS.Math.Content.8.EE.B.5	Expressions and Equations	0.45		
7	Multiple Choice	C	1	CCSS.Math.Content.7.G.B.6	Geometry	0.39		
8	Multiple Choice	A	1	CCSS.Math.Content.8.SP.A.2	Statistics and Probability	0.48		
11	Multiple Choice	D	1	CCSS.Math.Content.8.G.A.2	Geometry	0.79		
14	Multiple Choice	C	1	CCSS.Math.Content.8.F.A.3	Functions	0.44		
15	Multiple Choice	D	1	CCSS.Math.Content.7.G.A.2	Expressions and Equations	0.49		
16	Multiple Choice	B	1	CCSS.Math.Content.8.SP.A.3	Statistics and Probability	0.69		
19	Multiple Choice	B	1	CCSS.Math.Content.8.F.A.2	Functions	0.53		
20	Multiple Choice	A	1	CCSS.Math.Content.8.G.A.3	Geometry	0.63		
23	Multiple Choice	D	1	CCSS.Math.Content.8.G.A.4	Geometry	0.38		
24	Multiple Choice	B	1	CCSS.Math.Content.8.EE.C.8c	Expressions and Equations	0.60		
26	Multiple Choice	C	1	CCSS.Math.Content.8.G.C.9	Geometry	0.34		

Question	Type	Key	Points	Standard	Cluster	Multiple Choice Questions:	Constructed Response Questions:	
						Percentage of Students Who Answered Correctly (P-Value)	Average Points Earned	P-Value (Average Points Earned ÷ Total Possible Points)
Session 1 continued								
30	Multiple Choice	C	1	CCSS.Math.Content.8.F.A.2	Functions	0.52		
31	Multiple Choice	C	1	CCSS.Math.Content.8.SP.A.1	Statistics and Probability	0.62		
32	Multiple Choice	C	1	CCSS.Math.Content.8.SP.A.3	Statistics and Probability	0.48		
33	Multiple Choice	B	1	CCSS.Math.Content.8.G.C.9	Geometry	0.47		
Session 2								
34	Multiple Choice	A	1	CCSS.Math.Content.8.EE.B.5	Expressions and Equations	0.61		
35	Multiple Choice	A	1	CCSS.Math.Content.8.EE.B.6	Expressions and Equations	0.56		
36	Multiple Choice	D	1	CCSS.Math.Content.8.G.A.5	Geometry	0.45		
37	Multiple Choice	A	1	CCSS.Math.Content.7.G.A.3	Geometry	0.43		
38	Multiple Choice	B	1	CCSS.Math.Content.8.SP.A.4	Statistics and Probability	0.52		
39	Multiple Choice	D	1	CCSS.Math.Content.8.EE.A.4	Expressions and Equations	0.50		
40	Multiple Choice	B	1	CCSS.Math.Content.8.F.B.5	Functions	0.32		
41	Constructed Response		2	CCSS.Math.Content.8.EE.C.7a	Expressions and Equations		0.86	0.43
42	Constructed Response		2	CCSS.Math.Content.8.F.B.4	Functions		0.44	0.22
43	Constructed Response		2	CCSS.Math.Content.8.G.A.3	Geometry		0.82	0.41
44	Constructed Response		2	CCSS.Math.Content.8.EE.B.5	Expressions and Equations		1.16	0.58
45	Constructed Response		2	CCSS.Math.Content.8.F.A.2	Functions		0.98	0.49
46	Constructed Response		2	CCSS.Math.Content.8.EE.A.4	Expressions and Equations		1.08	0.54
47	Constructed Response		2	CCSS.Math.Content.8.F.A.3	Functions		0.56	0.28
48	Constructed Response		3	CCSS.Math.Content.8.EE.C.8c	Expressions and Equations		1.17	0.39

*This item map is intended to identify the primary analytic skills necessary to successfully answer each question. However, some questions measure proficiencies described in multiple standards, including a balanced combination of procedural and conceptual understanding.

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.

EXEMPLARY RESPONSE

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.

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

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

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

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.

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

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.

GUIDE PAPER 2

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.

$3x-6+7x=3x-1$
$10x-6=3x-1$
$-3x \quad -3x$
$7x-6=-1$
$+6 \quad =+6$
$7x=5$
$\frac{7x}{7}=\frac{5}{7}$
$x=.714$

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.

GUIDE PAPER 3

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.

GUIDE PAPER 4

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) **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.

GUIDE PAPER 5

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.

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

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

$10x - 6 = 3x - 1$

$+6 \quad +6$

$10x = 3x + 5$

$-3x \quad -3x$

$7x = 5$

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

$x = .7$

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.

GUIDE PAPER 6

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) 2

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.

GUIDE PAPER 7

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.

EXEMPLARY RESPONSE

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

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

$$\begin{aligned} y &= mx + b \\ (-5) &= 0.5(2) + b \\ -5 &= 1 + b \\ -6 &= b \end{aligned}$$

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-interupt. 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 $y = 0.5x - 6$.

$-3, -7.5 \quad 2, -5$

$-3 = 1.50$

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

$y = 0.5x + b$

$-7.5 = 0.5(-3) + b$

$-7.5 = -1.5 + b$

$+1.5 \quad +1.5$

$-6.0 = b$

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.

GUIDE PAPER 2

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 $\Rightarrow$

$y=0.5x-6$

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.

GUIDE PAPER 3

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.

GUIDE PAPER 4

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.

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

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.

GUIDE PAPER 5

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.

GUIDE PAPER 6

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.

GUIDE PAPER 7

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.

x	y
-3	-7.5
2	-5

5 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.

$(\overset{x_1}{-3}, \overset{y_1}{-7.5})$ $(\overset{x_2}{2}, \overset{y_2}{-5})$ $M = \frac{5 - -7.5}{2 - -3} = \frac{12.5}{5} = 2.5$ slope: 2.5 $y = 2.5x$

$y = .5x$ $-7.5 = .5(-3)$ $-7.5 \neq -1.5$ ✗

$y = .5x$ $-5 = .5(2)$ $-5 \neq 1$ ✗

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.

EXEMPLARY RESPONSE

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 $8 \times 2 = 16$ and $7 \times 2 = 14$.

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.

GUIDE PAPER 2

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)

B(8,7) $\xrightarrow{D_2}$ B'(16,14)

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 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.

GUIDE PAPER 3

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.

GUIDE PAPER 4

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.

GUIDE PAPER 5

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.

GUIDE PAPER 6

43

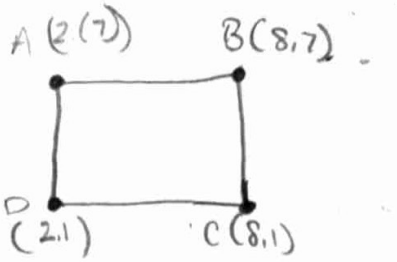
Square ABCD is located on a coordinate plane. The coordinates for three of the vertices are listed below.

- 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.



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.

GUIDE PAPER 7

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) because it's a square and squares have equal sides.

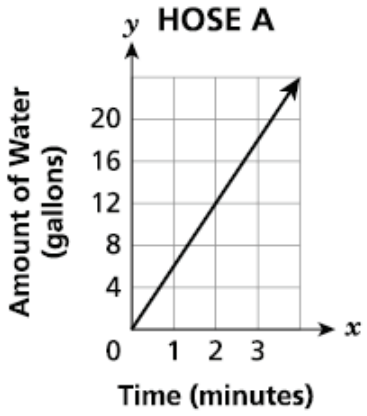
Score Point 0 (out of 2 points)

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.

EXEMPLARY RESPONSE

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.

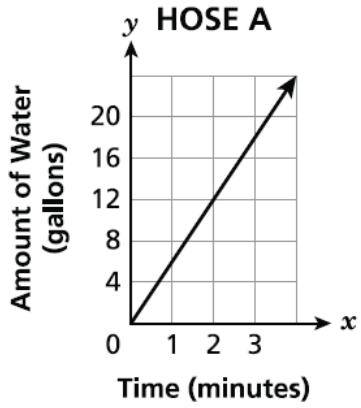
Hose A: $\frac{12}{2} = 6$ Hose B: $\frac{110}{10} = 11$

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.



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

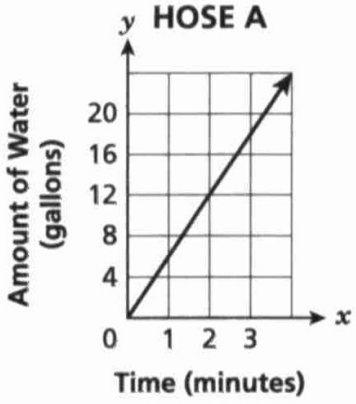
Score Point 2 (out of 2 points)

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.

GUIDE PAPER 2

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.

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

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

Answer Hose B and 11 gallons per minute

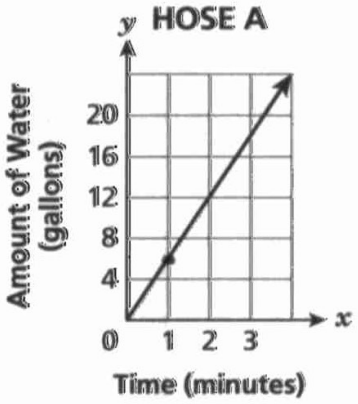
Score Point 2 (out of 2 points)

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.

GUIDE PAPER 3

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=6x 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.

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

y=11x B

Answer Hose B and 11 gallons per minute

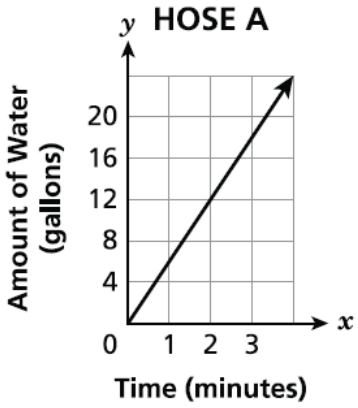
Score Point 2 (out of 2 points)

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.

GUIDE PAPER 4

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.

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

hose B: 110/10

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

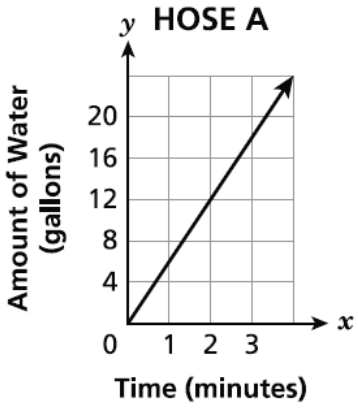
Score Point 1 (out of 2 points)

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.

GUIDE PAPER 5

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.

$110 \div 10 = 11$
$12 \div 2 = 6$

Answer Hose [A] and [6] gallons per minute

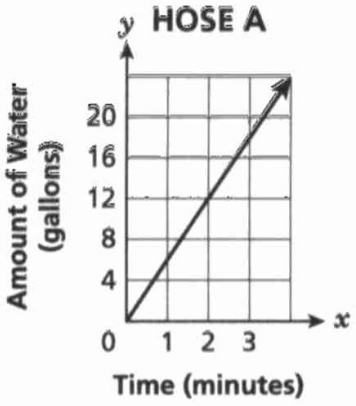
Score Point 1 (out of 2 points)

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

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.



20 g = 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?

Show your work.

B

110 = 10m

11 = 1m

B wins

11 = m

(11, 1)

Answer Hose B and 11 gallons per minute

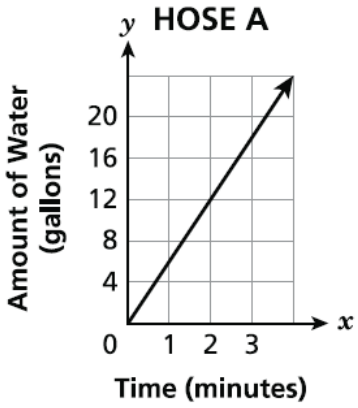
Score Point 1 (out of 2 points)

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.

GUIDE PAPER 7

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.

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

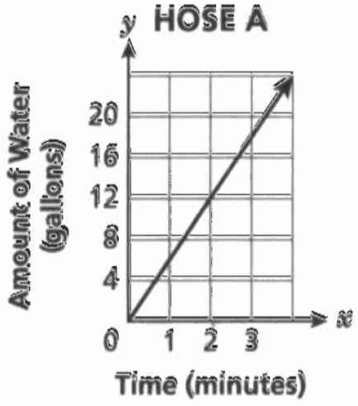
Answer Hose [B] and [27.5] gallons per minute

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.

1
12,2
12 2
12 2
12 2
+12 2
60,10

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.

EXEMPLARY RESPONSE

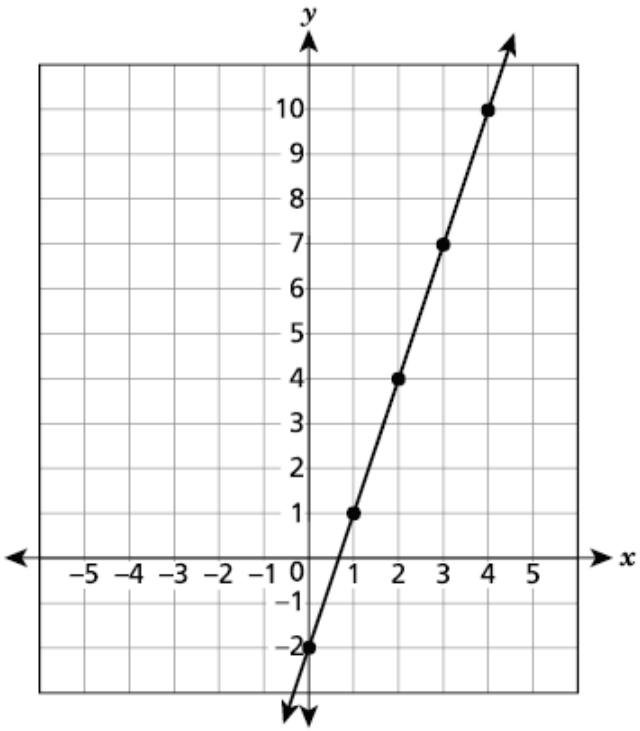
45

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

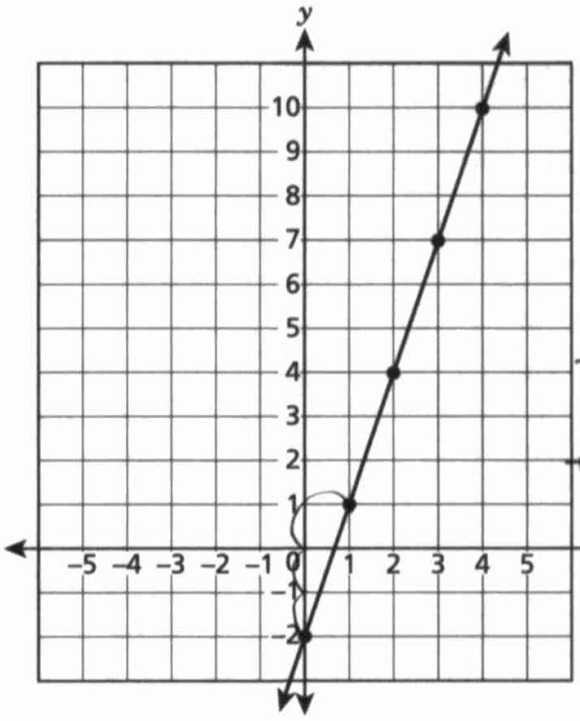
x	y
1	5
2	7
3	9
5	13
6	15

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

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

$m = 2$

FUNCTION B



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

$m = 3$

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.

GUIDE PAPER 2

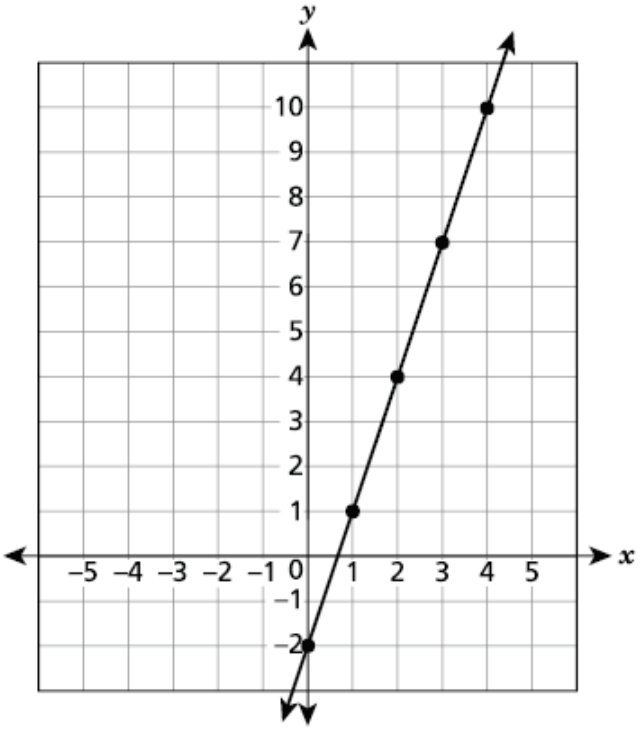
45

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 $\frac{15-13}{6-5} = 2$

Function B's Rate of Change

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

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.

GUIDE PAPER 3

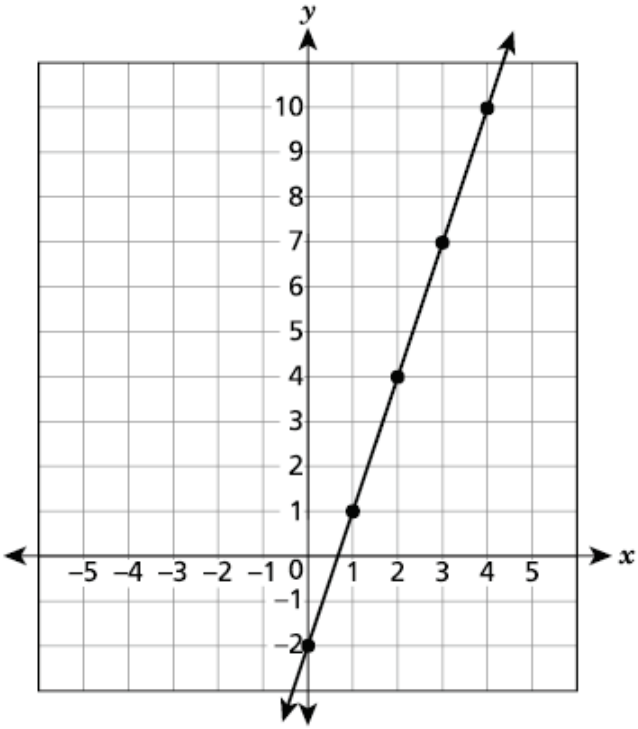
45

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.

GUIDE PAPER 4

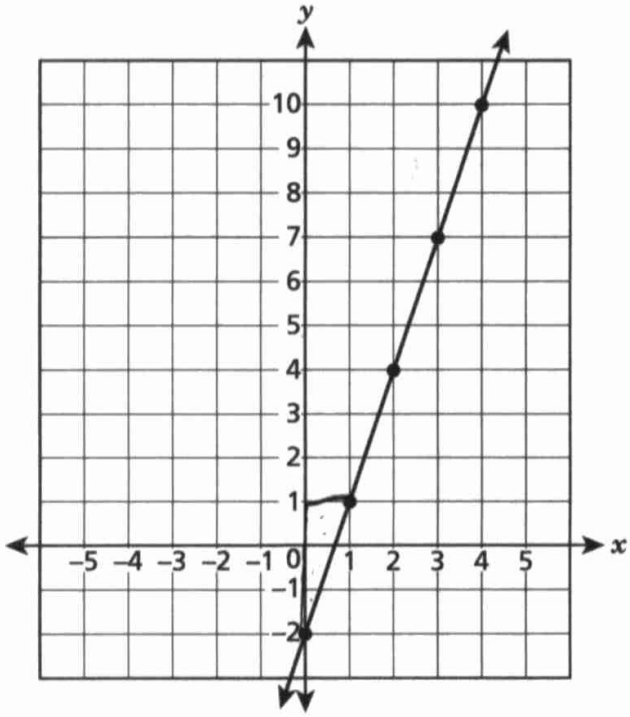
45

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.

GUIDE PAPER 5

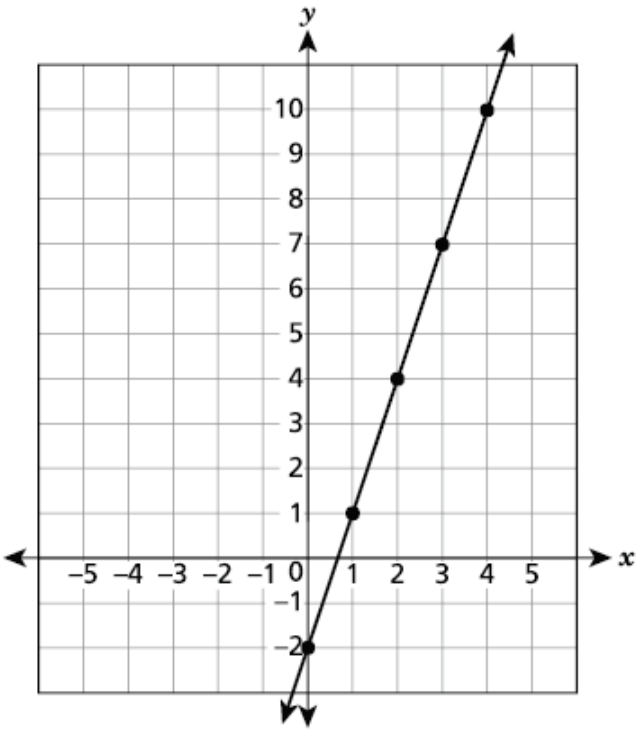
45

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.

GUIDE PAPER 6

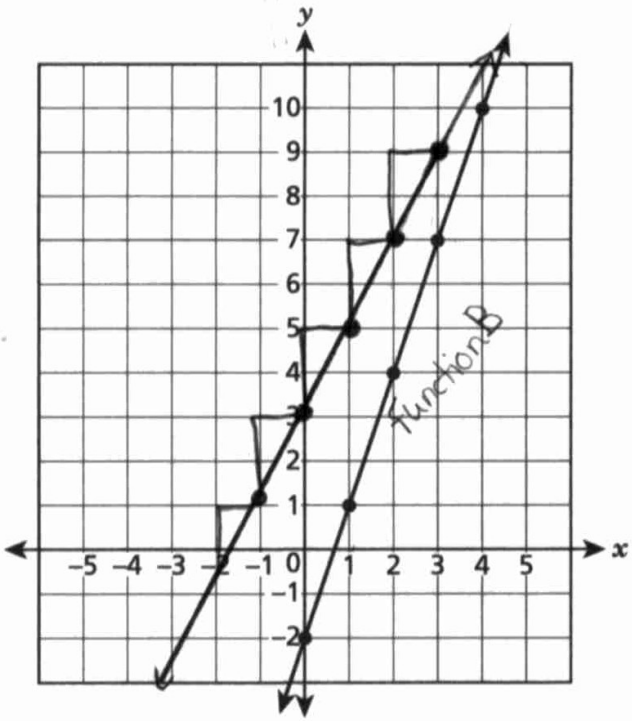
45

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 functio 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.

GUIDE PAPER 7

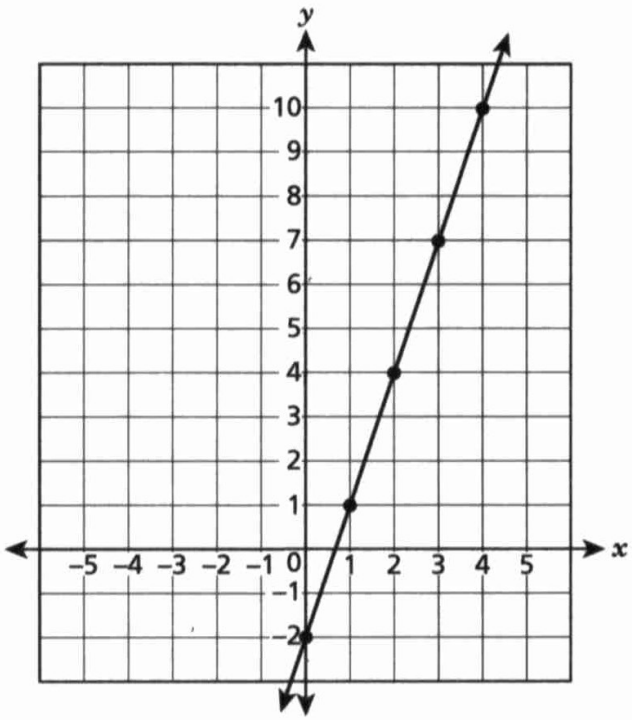
45

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.

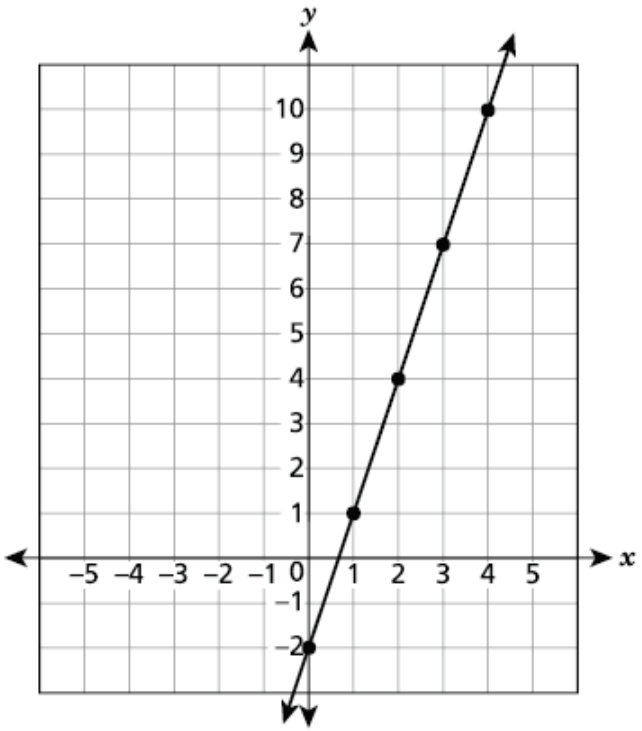
45

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.

EXEMPLARY RESPONSE

46

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

Show your work.

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

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

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.

$$\frac{-\frac{5.97\times(10)^{24}}{4.87\times(10)^{24}}}{1.1 \times (10)^{24}}$$

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

$(5.97 \times 10^24) - (4.87 \times 10^24)$
$= 1.1 \times 10^24$

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.

GUIDE PAPER 3

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.

4,870
- 5,970
- 1,100

Answer 1.1 x 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.

GUIDE PAPER 4

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 $5.92 \times (10)^{24}$ 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.

GUIDE PAPER 5

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.

4.8×10^{24}
5.97×10^{24} Same exponent

$5.97 - 4.8 = 1.17$

5.97×10^{24}
-4.8×10^{24}
1.17×10^{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.

GUIDE PAPER 6

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.

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

1.1×10^{0}

1.1×1

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.

GUIDE PAPER 7

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.

4,870,000,000,000,000,000,000,000

5.97×10^{24}

4.87×10^{22}

1.17×10^{2}

Answer 1.17×10^{2} 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.

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

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

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

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.

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

$$\begin{aligned} y &= mx + b \\ (6.25) &= 3(0.75) + b \\ 6.25 &= 2.25 + b \\ b &= 4 \end{aligned}$$

$y = 3x + 4$,
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 3/4 $y =$ 9 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.

GUIDE PAPER 2

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.

$y = mx + b$

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

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

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

$m = 3$

$y = 3x + b$

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

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

$b = 4$

$y = 3x + 4$

$x = 1$

$y = 3(1) + 4$

$y = 7$

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.

GUIDE PAPER 3

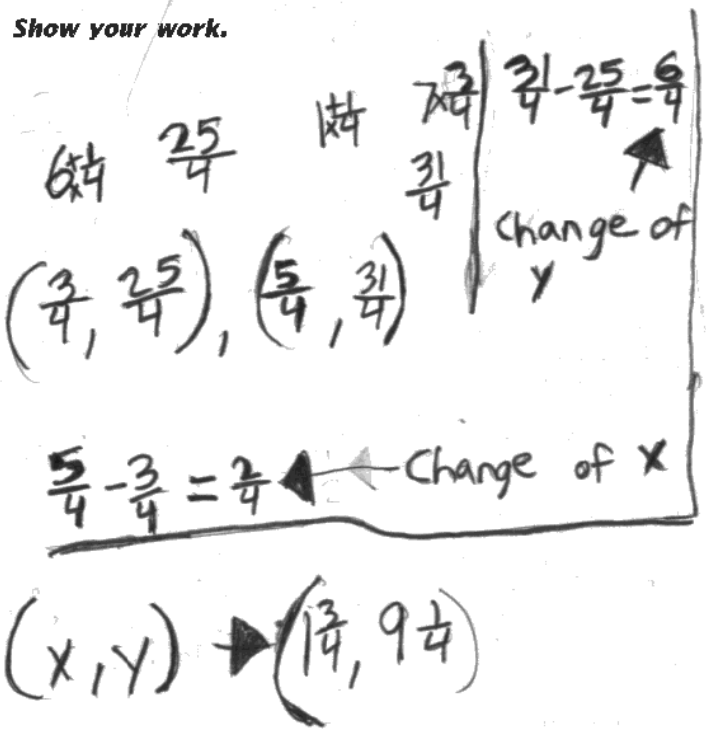
47

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.



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.

GUIDE PAPER 4

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.

$0.75 - 1.25 = [illegible]$ so $x = [illegible]$ $1\frac{3}{4}$

$6.25 - 7.75 = 1.5$ 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.

GUIDE PAPER 5

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

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

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

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.

GUIDE PAPER 6

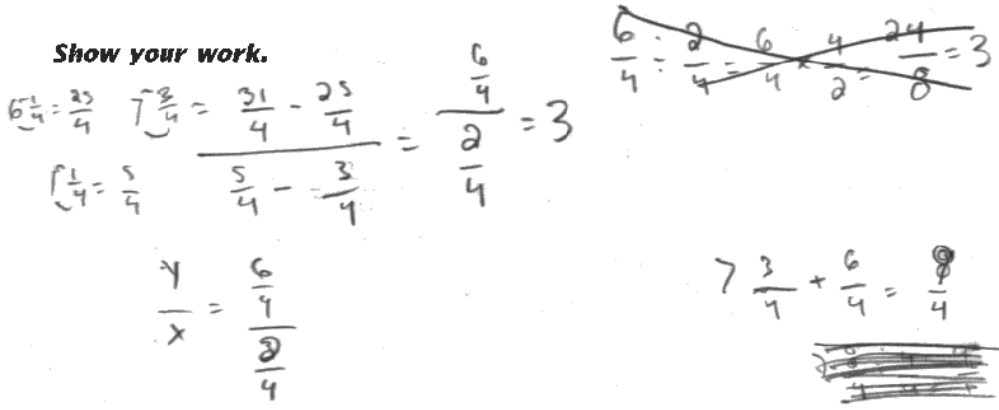
47

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.



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

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.

GUIDE PAPER 7

47

The ordered pairs below represent a linear function.

$\left(\frac{3}{4}, 6\frac{1}{4}\right), \left(1\frac{1}{4}, 7\frac{3}{4}\right), (x, y)$ 5

Which values could be the values of x and y?

Show your work. .5

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

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

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

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.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = \frac{1\frac{1}{4} - \frac{3}{4}}{7\frac{3}{4} - 6\frac{1}{4}}$ $\frac{1}{2}$ $1\frac{1}{2}$

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

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.

EXEMPLARY RESPONSE

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

$55b + 12v = 409$
$b - v = 5$

people in buses:
$7 \times 55 = 385$

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

people in vans:
$2 \times 12 = 24$

$55b + 12v = 409$
$12b - 12v = 60$

$(385 + 24 = 409)$
or other valid process

$67b = 469$
$b = 7$

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

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

24 students and teachers rode in vans

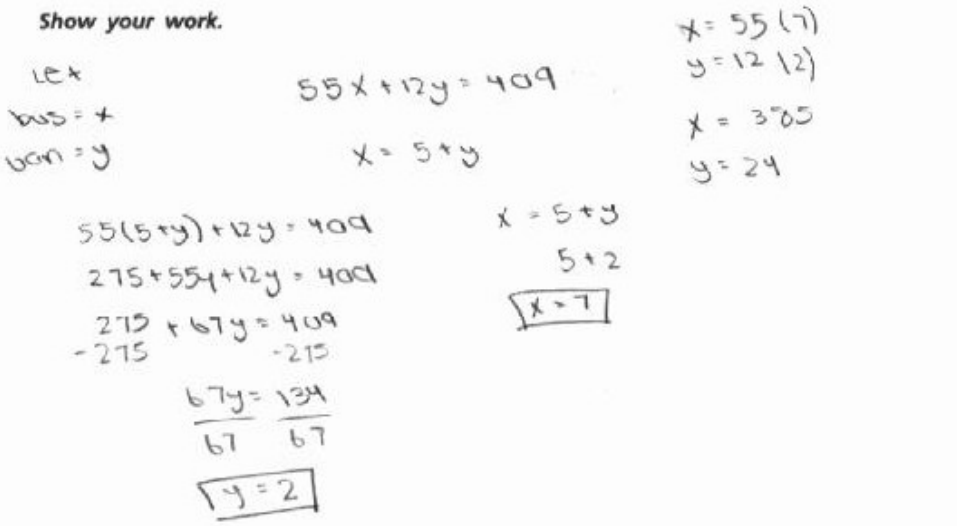
48

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.



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.

GUIDE PAPER 2

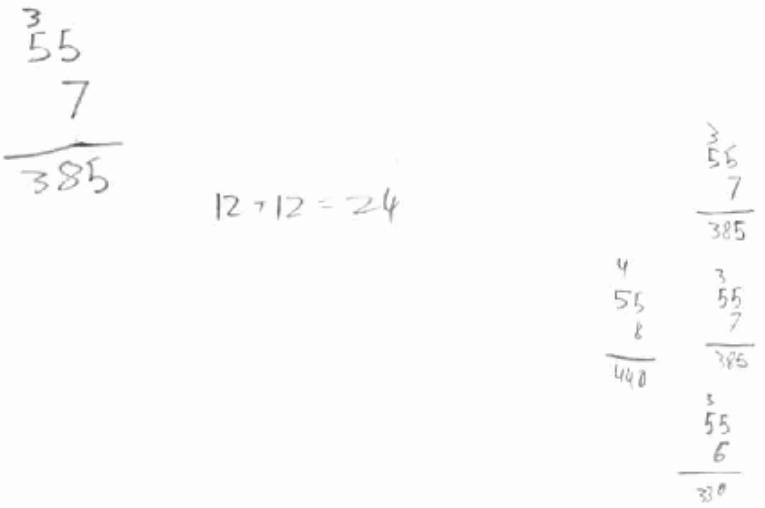
48

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 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.

GUIDE PAPER 3

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.

$55b + 12v = 409$

$55b + 12(b-5) = 409$

$55b + 12b - 60 = 409$

$67b - 60 = 409$

$+60$

$\frac{67b}{67} = \frac{469}{67}$

$b = 7$

$v + 5 = b$

-5

$v = b - 5$

$v + 5 = 7$

$-5 \quad -5$

$v = 2$

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.

GUIDE PAPER 4

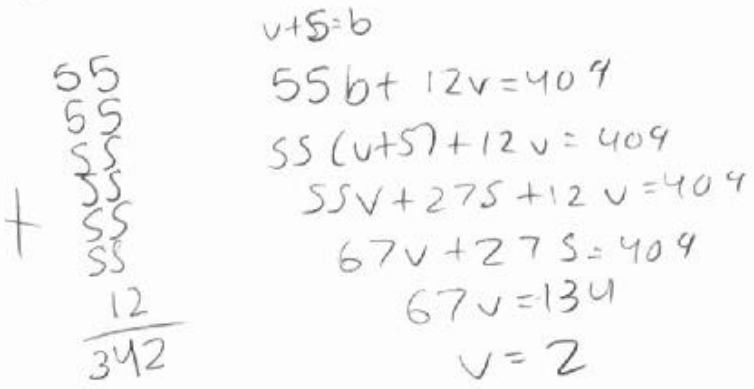
48

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 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.

GUIDE PAPER 5

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.

GUIDE PAPER 6

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.

$55b + 12v = 409$
$b - 5 = v$
$+5 \quad +5$
$b = v + 5$

$55(v+5) + 12 = 409$
$55v + 275 + 12 = 409$
$55v + 287 = 409$
$\frac{55v}{55} = \frac{122}{55}$
$v = 2.21...$

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

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 $12v$), 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.

GUIDE PAPER 7

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 ✓ T

2 vans = 24 ✓ 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.

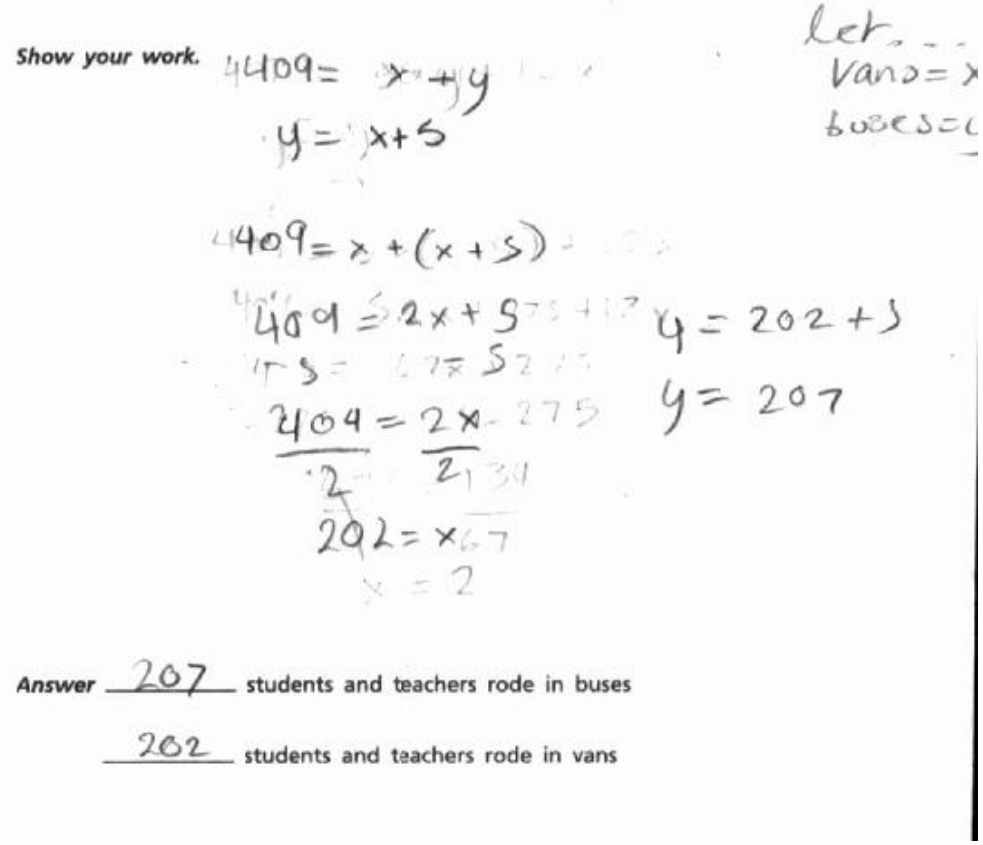
48

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.



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.

GUIDE PAPER 9

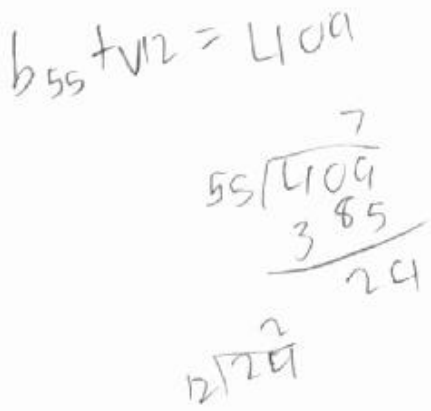
48

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 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.

GUIDE PAPER 10

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.

$55x + 12(y + 5) = 409$

$55x + 60 + 12y = 409$

$-60 \quad -60$

$55x + 12y = 349$

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 = (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.