New York State Testing Program

2023

Mathematics Test

Grade 8

Scoring Leader Materials

Training Set

Note to Scorers

You may notice that some questions in these scoring materials appear with a bracketed credit value showing the respective number of credits. This is due to a style change that was recently field tested; therefore, not all items will have the bracketed credit value. An example of what the bracketed credit value looks like is provided below for your reference.

Example: Stem of the question. [2]

Grade 8 Mathematics Reference Sheet

CONVERSIONS

1 yard = 3 feet
1 mile = 5,280 feet

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

CONVERSIONS ACROSS MEASUREMENT SYSTEMS

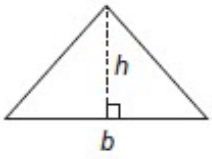
1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 1.609 kilometers
1 kilometer = 0.6214 mile

1 gallon = 3.785 liters
1 liter = 0.2642 gallon

1 pound = 0.454 kilogram
1 kilogram = 2.2 pounds

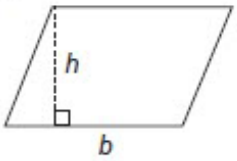
FORMULAS AND FIGURES

Triangle



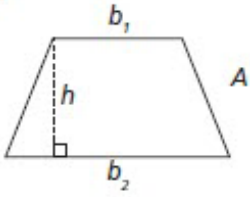
$A = \frac{1}{2}bh$

Parallelogram



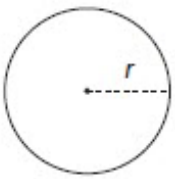
$A = bh$

Trapezoid



$A = \frac{1}{2}h(b_1 + b_2)$

Circle

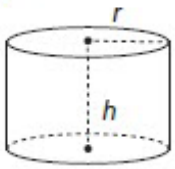


$C = 2\pi r$
$C = \pi d$
$A = \pi r^2$

General Prism

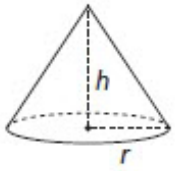
$V = Bh$

Right Cylinder



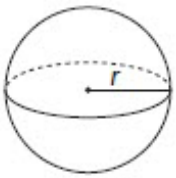
$V = \pi r^2 h$

Right Cone



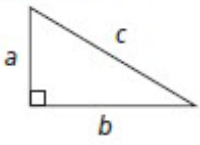
$V = \frac{1}{3}\pi r^2 h$

Sphere



$V = \frac{4}{3}\pi r^3$

Pythagorean Theorem



$c^2 = a^2 + b^2$

1-Credit Constructed-Response Rubric

1 Credit	A 1-credit response is a **correct answer** to the question which indicates a thorough understanding of mathematical concepts and/or procedures.
0 Credits*	A 0-credit response is incorrect, irrelevant, or incoherent.

* 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).

2-Credit Constructed-Response Holistic Rubric

2 Credits	A 2-credit 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 Credit	A 1-credit 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 Credits*	A 0-credit 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-Credit Constructed-Response Holistic Rubric

3 Credits	A 3-credit 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 Credits	A 2-credit 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 Credit	A 1-credit 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 Credits*	A 0-credit 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).

2023 1-Credit Constructed-Response Mathematics Scoring Policies

1. The student is **not** required to show work for 1-credit constructed-response question, therefore, any work shown will **not** be scored. A clearly identified correct response should still receive full credit.
2. If the student clearly identifies a correct answer but fails to write that answer in the answer space, the student should still receive full credit.
3. If the student provides one legible response (and one response only), the rater should score the response, even if it has been crossed out.
4. 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.
5. If the student provides more than one response but does not indicate which response is to be considered the correct response and none have been crossed out, the student shall not receive credit.
6. If the student does not provide the answer in the form as directed in the question, the student will not receive credit.
7. In questions requiring number sentences, the number sentences must be written horizontally.
8. When measuring angles with a protractor, there is a +/- 5 degrees deviation allowed of the true measure.
9. 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.

2023 2- and 3-Credit Constructed-Response Mathematics Scoring Policies

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 or provide an explanation, a correct answer with **no** work shown or **no** explanation provided, receives **no** credit.
4. If students are **not** directed to show work, any work shown will **not** be scored. This applies to questions that do **not** ask for any work and questions 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 have been crossed out, the student shall not receive full credit.
8. Trial-and-error responses are **not** subject to Scoring Policy #6 above, since crossing out is part of the trial-and-error process.
9. 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.
10. In questions requiring number sentences, the number sentences must be written horizontally.
11. When measuring angles with a protractor, there is a +/- 5 degrees deviation allowed of the true measure.
12. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question but that work results in a score of zero.

39

What is the solution for x in the equation $x^3 = 125$?

Answer _____

EXEMPLARY RESPONSE

39

What is the solution for x in the equation $x^3 = 125$?

5 *or* $x = 5$ *or* $5^3 = 125$

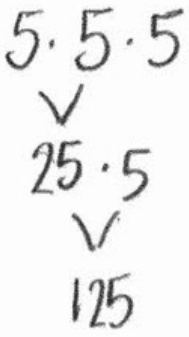
or equivalent answer

Answer _____

GUIDE PAPER 1

39

What is the solution for x in the equation $x^3 = 125$? [1]



Answer X=5

Score Point 1 (out of 1 credit)

A correct answer is provided.

39

What is the solution for x in the equation $x^3 = 125$?

Answer $5^3 = 125$

Score Point 1 (out of 1 credit)

A correct answer is provided.

39

What is the solution for x in the equation $x^3 = 125$?

Answer

$125 \div 5^3$

$= 1$

$x^3 = 5$

Score Point 0 (out of 1 credit)

An incorrect answer is provided.

40

Triangle DEF is a right triangle with a right angle at vertex F. Side $\overline{DF}$ has a length of 9 inches and side $\overline{FE}$ has a length of 12 inches. What is the length, in inches, of side $\overline{DE}$?

Answer _____ inches

EXEMPLARY RESPONSE

40

Triangle DEF is a right triangle with a right angle at vertex F. Side $\overline{DF}$ has a length of 9 inches and side $\overline{FE}$ has a length of 12 inches. What is the length, in inches, of side $\overline{DE}$?

15 *or* DE = 15

or equivalent answer

Answer _____ inches

40

Triangle DEF is a right triangle with a right angle at vertex F. Side $\overline{DF}$ has a length of 9 inches and side $\overline{FE}$ has a length of 12 inches. What is the length, in inches, of side $\overline{DE}$?

Answer 15 inches

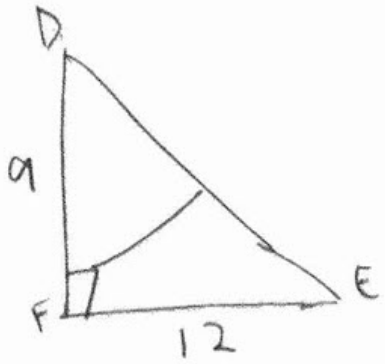
Score Point 1 (out of 1 credit)

A correct answer is provided.

GUIDE PAPER 2

40

Triangle DEF is a right triangle with a right angle at vertex F. Side $\overline{DF}$ has a length of 9 inches and side $\overline{FE}$ has a length of 12 inches. What is the length, in inches, of side $\overline{DE}$? [1]



$9^2 + 12^2 = 225$

$\sqrt{225} = 15$

15 inches

Answer 15 inches

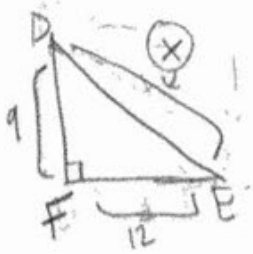
Score Point 1 (out of 1 credit)

A correct answer is provided.

GUIDE PAPER 3

40

Triangle DEF is a right triangle with a right angle at vertex F. Side $\overline{DF}$ has a length of 9 inches and side $\overline{FE}$ has a length of 12 inches. What is the length, in inches, of side $\overline{DE}$? [1]



$\sqrt{c^2 = a+b}$ ~~$c = a+b = 12 = 9+3$~~?

~~$c = 9+12 = 21$~~

$c^2 = 9^2 + 12^2$

$\sqrt{c^2} = 81 + 144$

$c = 9 + 12$

Answer 21 inches

Score Point 0 (out of 1 credit)

An incorrect answer is provided.

41

An equation is shown below.

$$-8 - 5x = 20$$

What is the value of x?

Answer _____

EXEMPLARY RESPONSE

41

An equation is shown below.

$$-8 - 5x = 20$$

What is the value of x?

Answer -5.6 *or* $-\frac{28}{5}$ *or* $-5\frac{3}{5}$ *or equivalent answer*

41

An equation is shown below.

$$-8 - 5x = 20$$

What is the value of x?

Answer x=-5.6

Score Point 1 (out of 1 credit)

A correct answer is provided.

GUIDE PAPER 2

41

An equation is shown below.

$$-8 - 5x = 20$$

What is the value of x? [1]

$-8 - 5x = 20$

$\frac{-5x}{-5} = \frac{28}{-5}$

$x = -\frac{28}{5}$

check:

$-8 - 5\left(-\frac{28}{5}\right) = 20$

$-8 + 28 = 20$

$20 = 20$ ✓

Answer $x = \frac{-28}{5}$

Score Point 1 (out of 1 credit)

A correct answer is provided.

GUIDE PAPER 3

41

An equation is shown below.

$-8 - 5x = 20$

What is the value of x? [1]

$-6+28=20$

$28/5 = 5.6$

$X = 5.6$

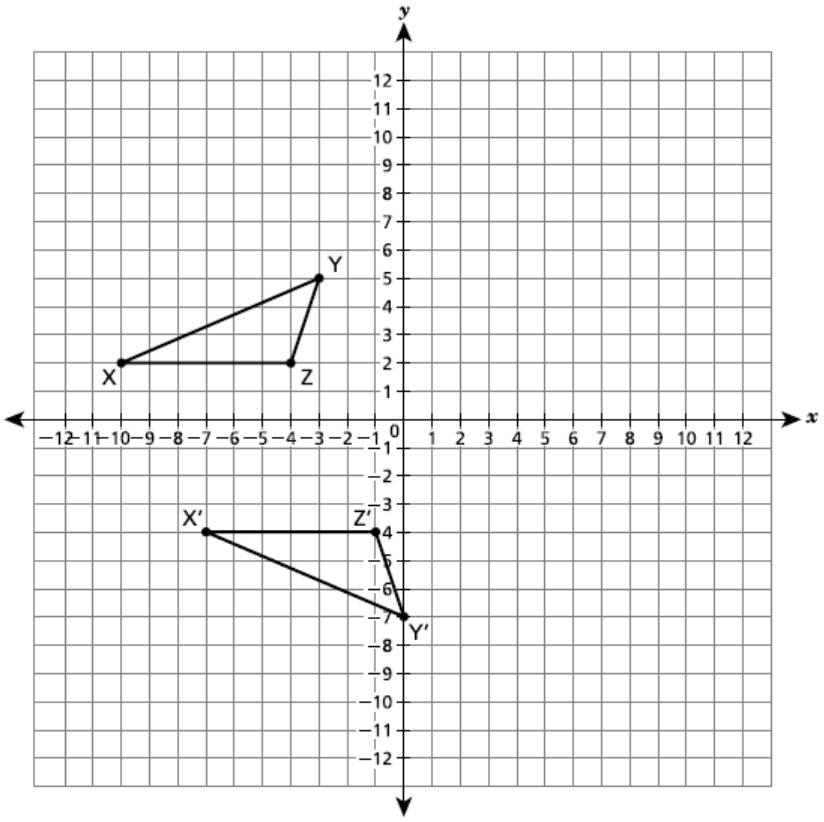
Answer 5.6

Score Point 0 (out of 1 credit)

An incorrect answer is provided.

42

Triangle XYZ and its congruent image triangle X′Y′Z′ are shown on the coordinate plane below.



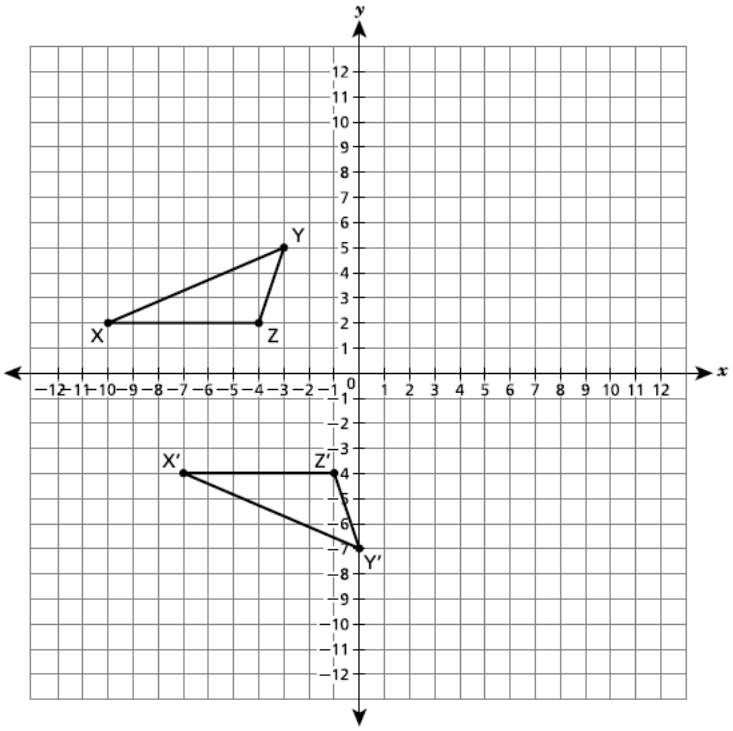
Describe a sequence of transformations that maps triangle XYZ onto triangle X′Y′Z′.

Explain your answer.

EXEMPLARY RESPONSE

42

Triangle XYZ and its congruent image triangle X′Y′Z′ are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X′Y′Z′.

Explain your answer.

Reflect triangle XYZ over the x-axis, then translate 3 units to the right and 2 units down.

or

Translate triangle XYZ 3 units to the right and 2 units up, then reflect over the x-axis.

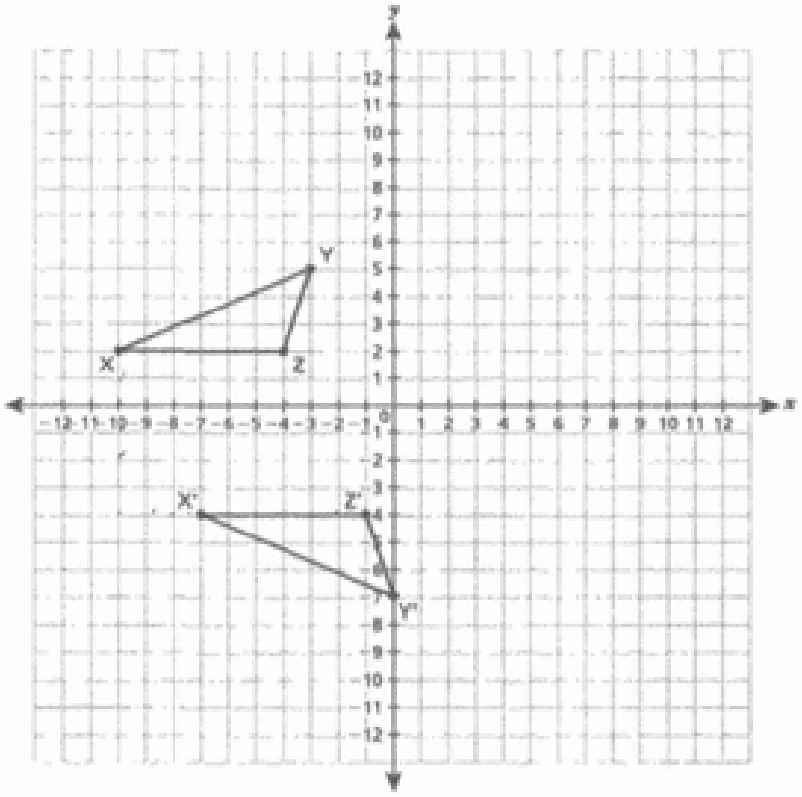
or

Reflect triangle XYZ over the x-axis, then a translation of $(x, y) \rightarrow (x + 3, y - 2)$.

or other valid explanation

42

Triangle XYZ and its congruent image triangle X′Y′Z′ are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X′Y′Z′. [2]

Explain your answer.

reflection across the x axis and then a translation of 2 units down and 3 units to the right

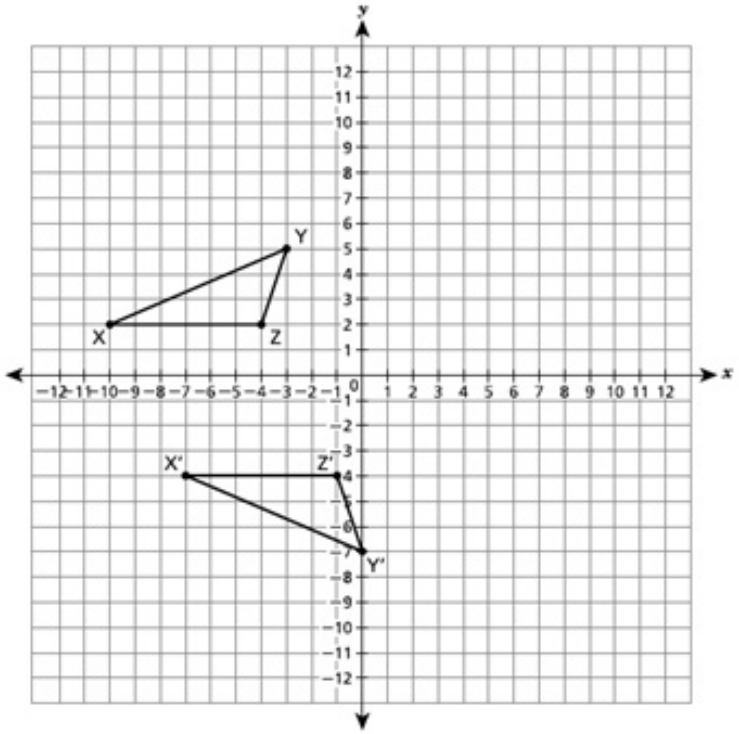
Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. A correct sequence of transformations is described to map triangle XYZ onto triangle X′Y′Z′. The explanation is complete and correct.

GUIDE PAPER 2

42

Triangle XYZ and its congruent image triangle X′Y′Z′ are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X′Y′Z′.

Explain your answer.

the triangle was reflected over the x axis and then translated (3,-2)

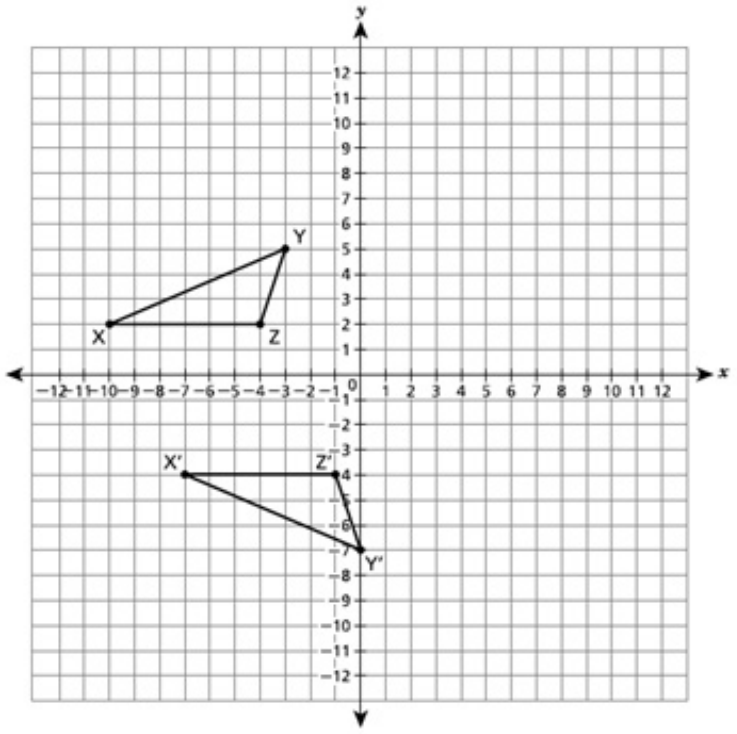
Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. A correct sequence of transformations is described to map triangle XYZ onto triangle X′Y′Z′. The phrase "*translated (3,-2)*" is an acceptable notation for the translation. The explanation is complete and correct.

GUIDE PAPER 3

42

Triangle XYZ and its congruent image triangle X′Y′Z′ are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X′Y′Z′.

Explain your answer.

First, flip the triangle XYZ over the x axis. After which, translate the triange XYZ, down two and right three. Now you have X'Y'Z'.

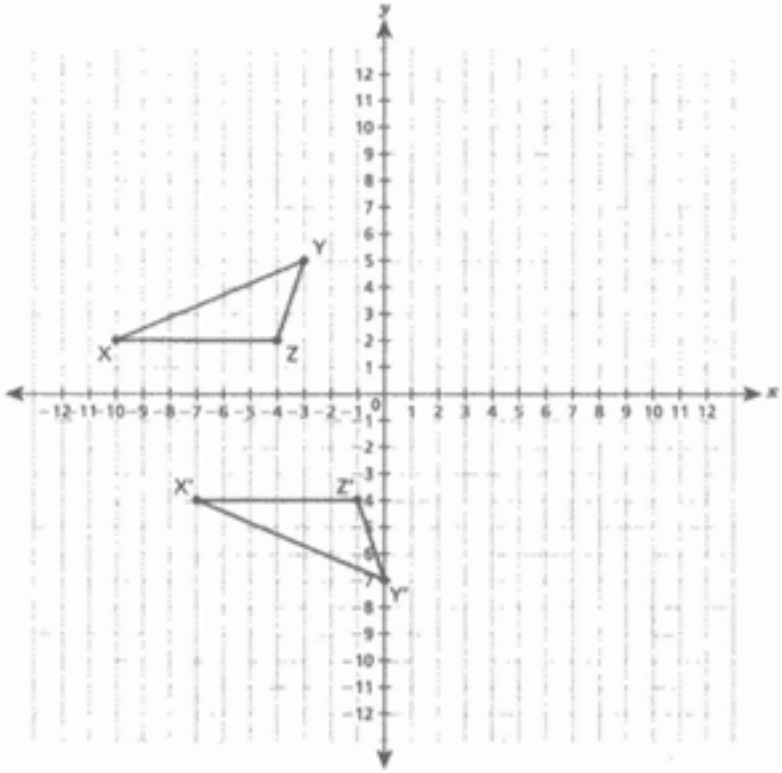
Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. A correct sequence of transformations is described to map triangle XYZ onto triangle X′Y′Z′. The word "*flip*" is understood to mean reflection. The explanation is complete and correct.

GUIDE PAPER 4

42

Triangle XYZ and its congruent image triangle X'Y'Z' are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X'Y'Z'. [2]

Explain your answer.

Move x', Y', Z' three spaces right one space up and the flip across the x axis

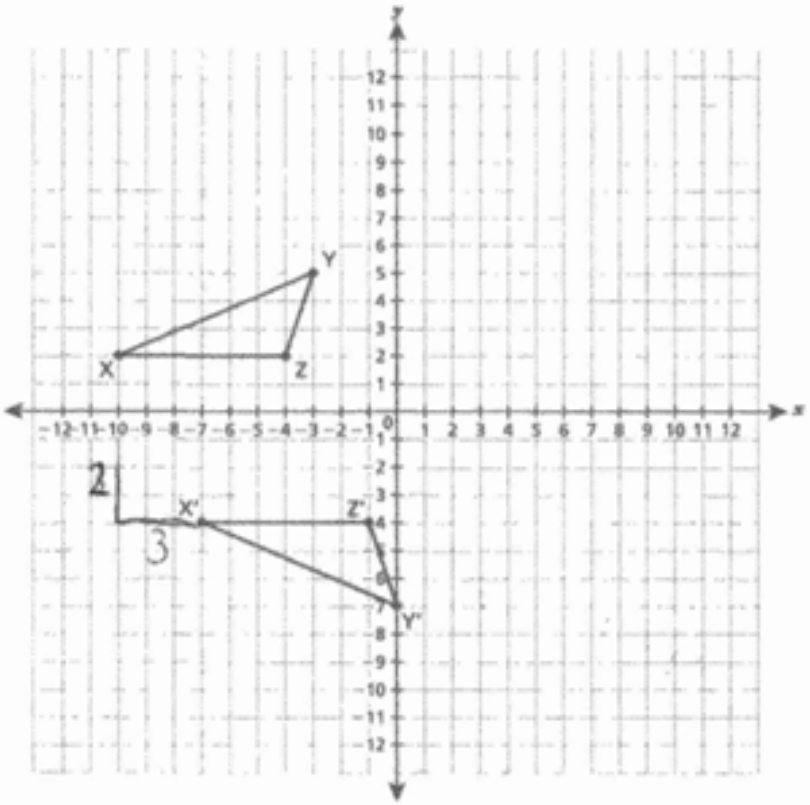
Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The phrase "*move X'Y'Z'*" has a notation error because it should be XYZ. The reflection is described correctly, but the translation should be 2 units up instead of "*one space up*". Although the word "*flip*" was used instead of reflect, it does not detract from the demonstration of understanding what type of transformation is needed to complete the mapping. This response correctly addresses only some elements of the task.

GUIDE PAPER 5

42

Triangle XYZ and its congruent image triangle X'Y'Z' are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X'Y'Z'. [2]

Explain your answer.

First there was a reflection, then there was a translation of 2 down, and 3 to the right to get X'Y'Z'.

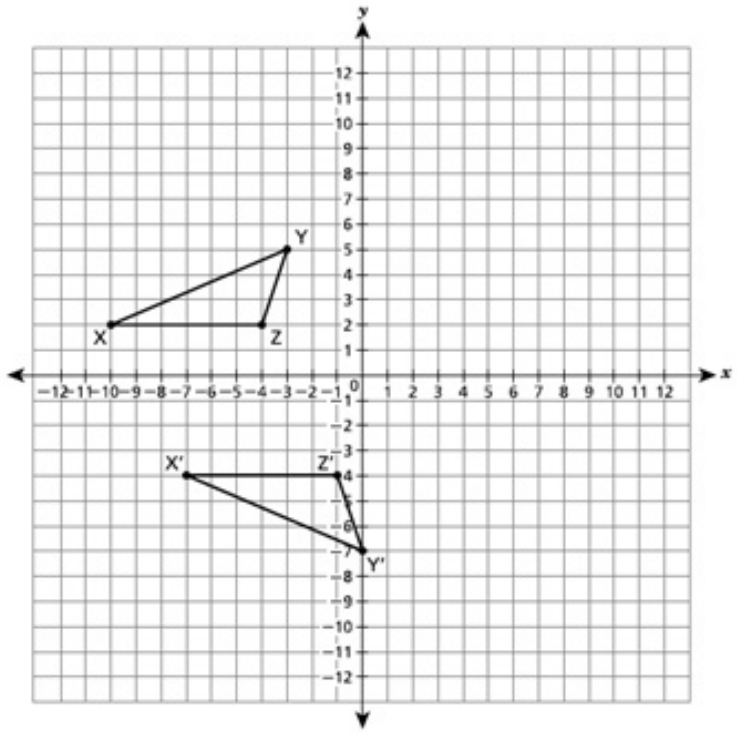
Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The translation is described correctly, but the description of the reflection is incomplete as it does not state the line of reflection being the *x*-axis. This response correctly addresses only some elements of the task.

GUIDE PAPER 6

42

Triangle XYZ and its congruent image triangle X'Y'Z' are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X'Y'Z'.

Explain your answer.

reflection over the x-axis

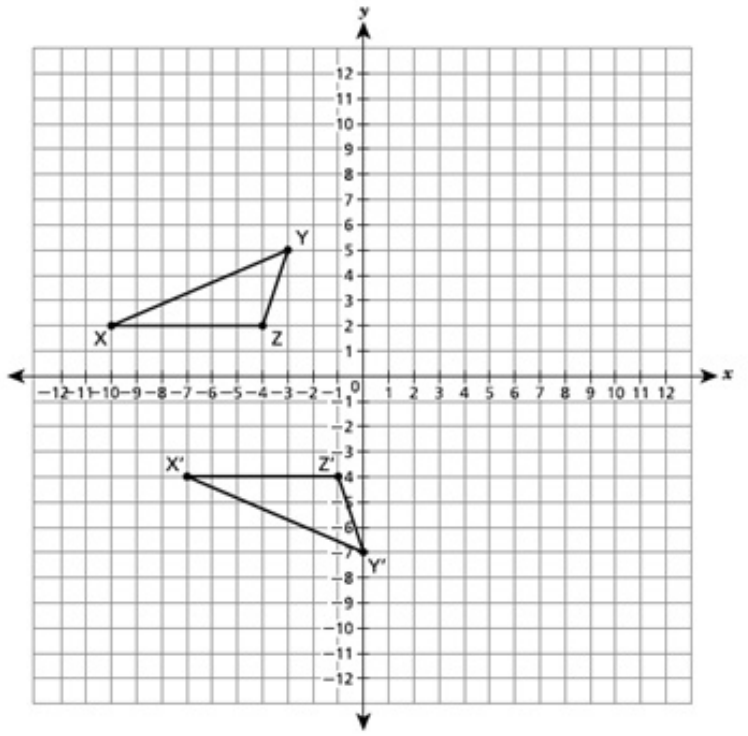
Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The reflection is described correctly, but the translation is not addressed. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

42

Triangle XYZ and its congruent image triangle X'Y'Z' are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X'Y'Z'.

Explain your answer.

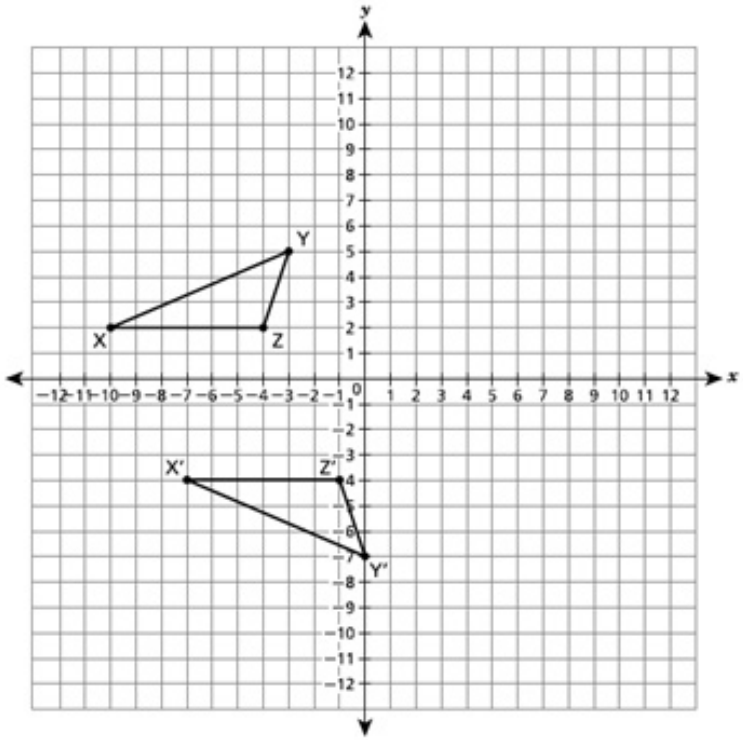
it was moved over 3 units and flipper over on the y axis

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The description of the translation is incomplete and the incorrect line of reflection is described. Holistically, the explanation is insufficient to show any understanding.

42

Triangle XYZ and its congruent image triangle X'Y'Z' are shown on the coordinate plane below.



Describe a sequence of transformations that maps triangle XYZ onto triangle X'Y'Z'.

Explain your answer.

go left 3 and flip an do up 10

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The reflection does identify the axis, the horizontal translation is incorrect, and the vertical translation is incorrect. Holistically, the explanation is insufficient to show any understanding.

43

What value of x makes the equation shown below true?

$$24x + 33 = 3(5x + 21) - 9$$

Show your work.

Answer $x =$ _____

EXEMPLARY RESPONSE

43

What value of x makes the equation shown below true?

$$24x + 33 = 3(5x + 21) - 9$$

Show your work.

$24x + 33 = 3(5x + 21) - 9$

$24x + 33 = 15x + 63 - 9$

$24x + 33 = 15x + 54$

$9x = 21$

$x = 21/9$

or

$24x + 33 = 3(5x + 21) - 9$

$(24x + 33) / 3 = (3(5x + 21) - 9) / 3$

$8x + 11 = 5x + 21 - 3$

$8x + 11 = 5x + 18$

$3x = 7$

$x = 7/3$

or other valid process

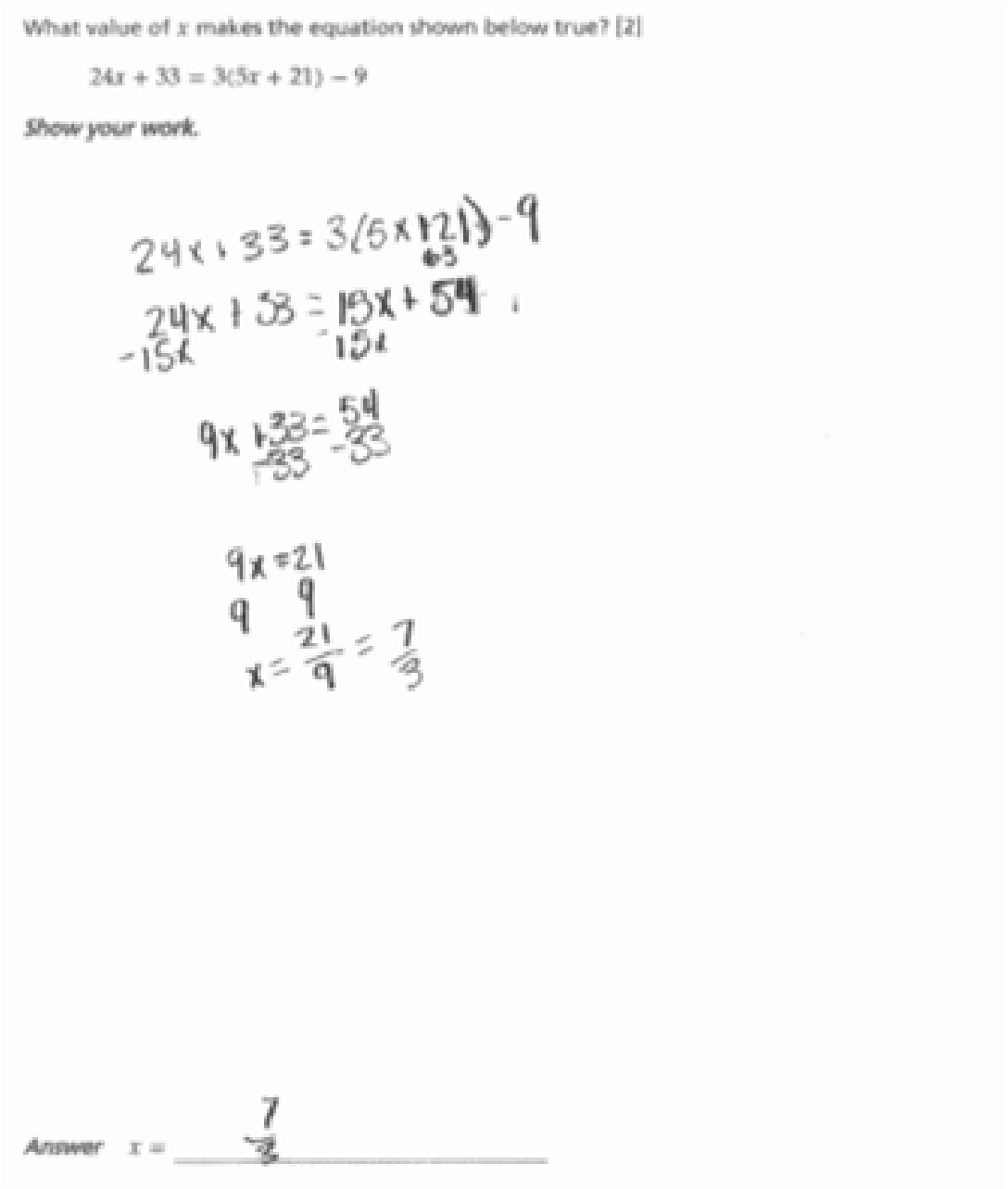
Answer $x =$ *$21/9$ or $7/3$ or $2\frac{1}{3}$ or $2.\overline{3}$ or equivalent answer*

43

What value of x makes the equation shown below true? [2]

$24x + 33 = 3(5x + 21) - 9$

Show your work.



Answer $x =$ 7/3

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The value of x is correctly determined using mathematically sound procedures. This response is complete and correct.

GUIDE PAPER 2

43

What value of x makes the equation shown below true?

$$24x + 33 = 3(5x + 21) - 9$$

Show your work.

24x+33=3(5x+21)-9
24x+33=15x+54
-33 -33
24x=15x+21
-15x -15x
9x=21
/9 /9
x=2.3̄

Answer $x =$ $2.\overline{3}$

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The value of x is correctly determined using mathematically sound procedures. This response is complete and correct.

GUIDE PAPER 3

43

What value of x makes the equation shown below true? [2]

$24x + 33 = 3(5x + 21) - 9$

Show your work.

1. $24x + 33 = 15x + 63 - 9$
2. $24x + 33 = 15x + 54$
   $-15 \quad -15$
3. $9x + 33 = 54$
   $-33 \quad -33$
4. $\frac{9x}{9} = \frac{21}{9}$
5. $x = \frac{21}{9}$

Check

$24\left(\frac{21}{9}\right) + 33 = 89$ ✓

$3\left(5\left(\frac{21}{9}\right) + 21\right) - 9 = 89$ ✓

Answer $x = \frac{21}{9}$

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The value of x is correctly determined using mathematically sound procedures. Although -15 was written instead of $-15x$ when isolating the linear term, it does not detract from the demonstration of understanding. The correct resulting linear term, $9x$, appears in subsequent steps. This response is complete and correct.

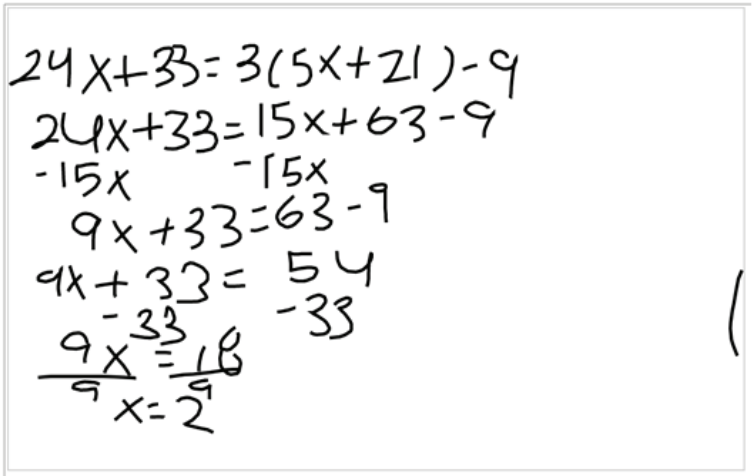
GUIDE PAPER 4

43

What value of x makes the equation shown below true?

$$24x + 33 = 3(5x + 21) - 9$$

Show your work.



Answer $x =$ 2

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. Correct procedures are used to solve for x; however, a subtraction error ($54 - 33 \neq 18$) results in an incorrect solution. The rest of the work is performed correctly. This response contains an incorrect solution but applies a mathematically appropriate process.

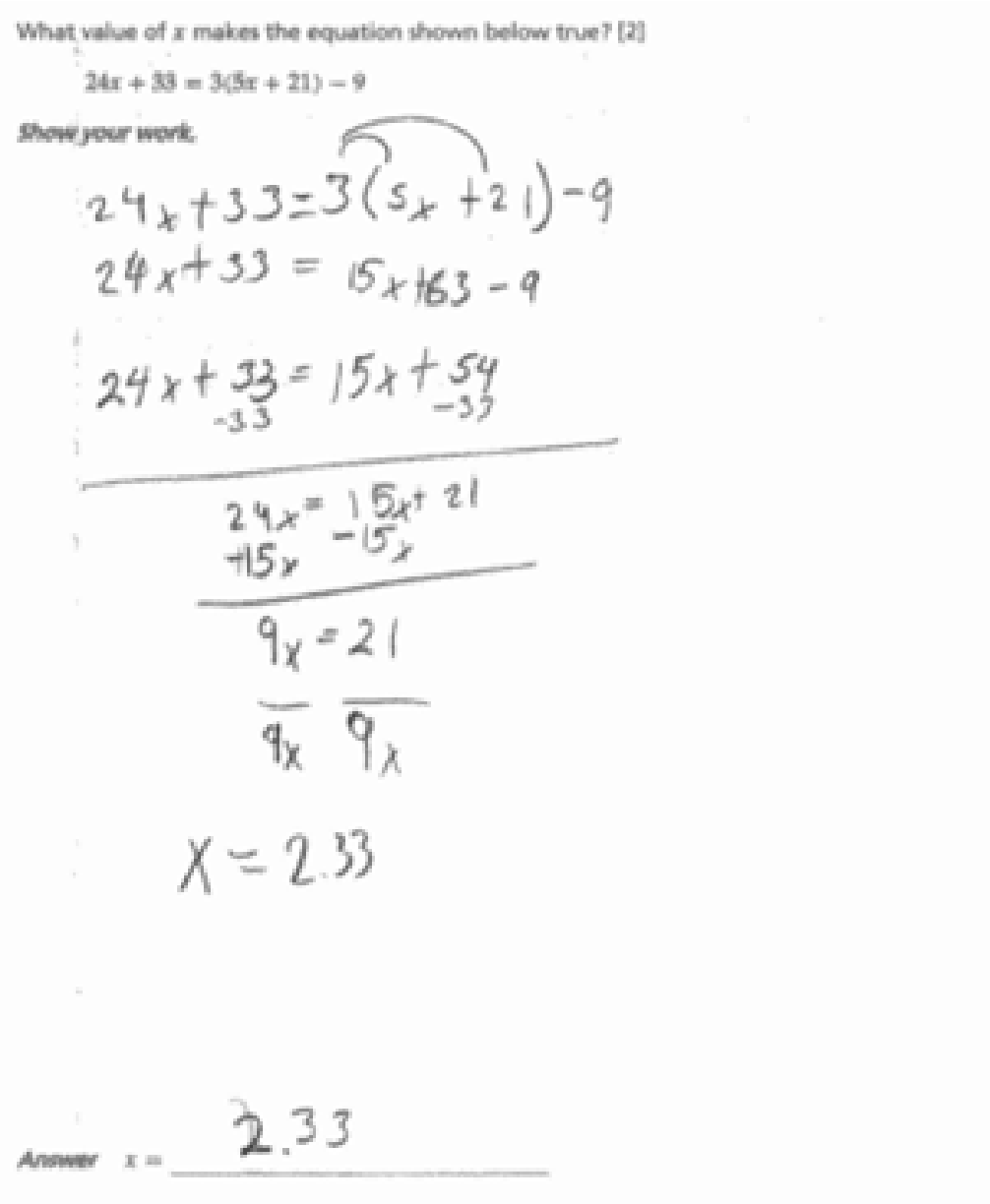
GUIDE PAPER 5

43

What value of x makes the equation shown below true? [2]

$24x + 33 = 3(5x + 21) - 9$

Show your work.



Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The distributive property is used correctly, and like terms are combined correctly, but division by $9x$, instead of 9, is shown in the work, and the final solution is inappropriately rounded or truncated to the hundredths place. This response correctly addresses only some elements of the task.

GUIDE PAPER 6

43

What value of x makes the equation shown below true?

$$24x + 33 = 3(5x + 21) - 9$$

Show your work.

24x+33=3(5x+21)-9
24x+33=15x+63-9
39x+33=63-9
39x+33=54
39x=21
x=0.53

Answer $x =$ 0.53

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The distributive property is applied correctly. However, $15x$ should be subtracted, not added, from both sides. Like terms are then correctly combined, but the solution is truncated. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

43

What value of x makes the equation shown below true?

$24x + 33 = 3(5x + 21) - 9$

Show your work.

24x+33=3(5x+21)-9

Answer $x =$ 2.333333.....

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although the answer is correct, no work is shown to support the calculated solution. Per Scoring Policy #3 for 2- and 3-credit responses, if students are directed to show work, a correct answer with no work shown receives no credit.

43

What value of x makes the equation shown below true?

$$24x + 33 = 3(5x + 21) - 9$$

Show your work.

24x+33=3(5x+21)-9
24x+33=15x+60-9
9x+33=60-9
9x=51

Answer $x =$ 5.7

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although the response shows some elements of correctly solving the equation, the work contains many procedural errors. Holistically, this response shows no overall understanding.

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer.

Explain how you determined your answer.

EXEMPLARY RESPONSE

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer.

Explain how you determined your answer.

Triangle RST is **not** a right triangle because the Pythagorean relationship using the three sides of the triangle does not hold true:

$c^2 \neq a^2 + b^2$

$13^2 \neq 8^2 + 10^2$

$169 \neq 164$

or other valid explanation

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer.

Explain how you determined your answer.

In order to calculate the answer, we need to know that

1. The required equasion is $a^2 + b^2 = c^2$

If the statement is true, then the triangle in question, aka triangle RST is a right triangle.

2. c is always the largest number, the other two are interchangeable.

$8^2 + 10^2 = 13^2$

$164 \neq 169$

Triangle RST is not a right triangle.

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The Pythagorean theorem is correctly used to explain that triangle RST is not a right triangle. The explanation is complete and correct.

GUIDE PAPER 2

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer. [2]

Explain how you determined your answer.

Triangle RST is not a right triangle, when you plug in the numbers into the equation $a^2+b^2=c^2$, c^2 doesn't equal to $169/13^2$, it equals to 164.

$a^2+b^2=c^2$

$8^2+10^2=13^2$

$64+100=169$

$164=169$

×

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The Pythagorean theorem is correctly used to explain that triangle RST is not a right triangle. The explanation is complete and correct.

GUIDE PAPER 3

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer. [2]

Explain how you determined your answer.

Triangle RST is not a right triangle because $a^2+b^2=c^2$ and in this case $8^2+10^2 \neq 13^2$ because $164 \neq 169$.

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The Pythagorean theorem is correctly used to explain that triangle RST is not a right triangle. The explanation is complete and correct.

GUIDE PAPER 4

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer. [2]

Explain how you determined your answer.

Triangle RST is not a right triangle because, if you use the Pythagorean Theorem $a^2+b^2=c^2$ both legs (a^2+b^2) does not equal to the hypotenuse (c^2).

$8^2 + 10^2 = 13^2$

$24 + 100 = 169$

$124 \neq 169$ No

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The explanation correctly states that triangle RST is not a right triangle. The side lengths are correctly substituted into the Pythagorean theorem; however, a calculation error occurs ($8^2 \neq 24$), resulting in an incorrect value for a^2. This response correctly addresses only some elements of the task.

GUIDE PAPER 5

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer.

Explain how you determined your answer.

RST is not a right triangle because when I used $a^2 + b^2 = c^2$, The valuse of c was not 13 but it was 12.8

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The explanation correctly states that triangle RST is not a right triangle. A rounded value of the hypotenuse with legs 8 and 10 is calculated and identified to be different from the given value of 13; however, the explanation is insufficient because it is unclear how 12.8 is obtained. This response correctly addresses only some elements of the task.

GUIDE PAPER 6

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer.

Explain how you determined your answer.

No. If you substitute the numbers into the pythagorean theorem, the equation is incorrect.

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The explanation correctly states that triangle RST is not a right triangle but the explanation is incomplete because it is lacking supporting work. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer.

Explain how you determined your answer.

No, my calculator said it was 164, which is below 169

Score Point 0 (out of 2 credits)

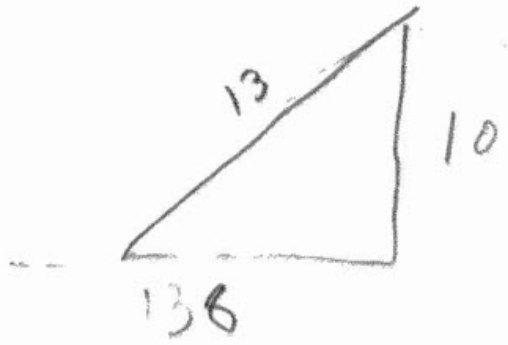
This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although comparing 164 and 169 is part of a correct process when using the Pythagorean theorem, it is unclear how 164 and 169 are obtained. Holistically, the explanation is insufficient to show any understanding.

44

Triangle RST has side lengths of 8 centimeters, 10 centimeters, and 13 centimeters. Is triangle RST a right triangle? Be sure to include what you know about the Pythagorean theorem in your answer. [2]

Explain how you determined your answer.

I think it is a right triangle because they all have different units and are smallest to biggest following the terms of a right triangle



Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The Pythagorean theorem is not used, and an incorrect conclusion is reached that triangle RST is a right triangle. Holistically, the explanation is insufficient to show any understanding.

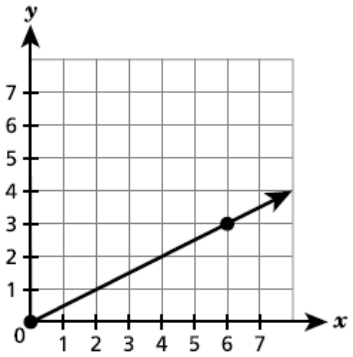
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer.

Explain how you determined your answer.

EXEMPLARY RESPONSE

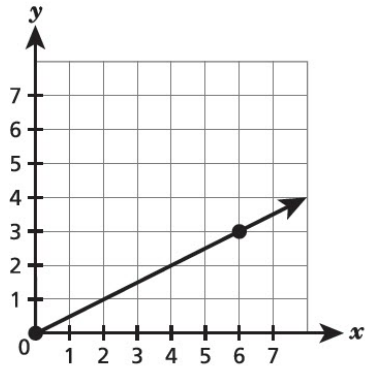
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer.

Explain how you determined your answer.

Function A rate of change is:

$\Delta y/\Delta x = 12/2 = 6/1 = 6$

Function B rate of change is:

$\Delta y/\Delta x = 3/6 = 1/2$

Function A has a greater rate of change.

$6 > 1/2$.

or other valid explanation

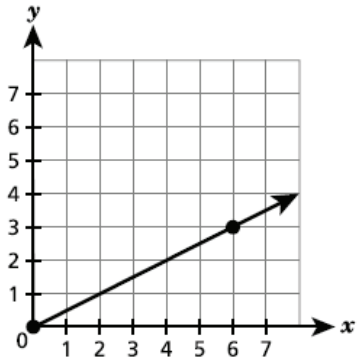
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer.

Explain how you determined your answer.

function a is greater because its rate of change is 6 while function b has a rate of change of $\frac{1}{2}$

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The rates of change are correctly determined, and Function A is identified as having the greater rate of change. The explanation is sufficient to show a thorough understanding.

GUIDE PAPER 2

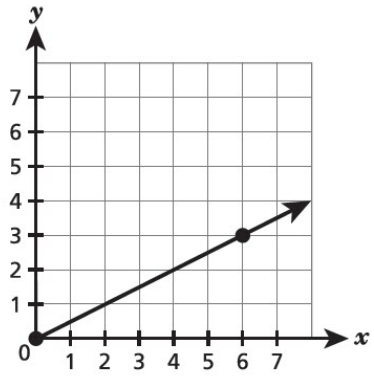
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer.

Explain how you determined your answer.

Function A has a greater rate of change. I found this by using the formula,

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

Using this for both functions, the rate of change for Function A is 6 and the rate of change for Function B is $\frac{1}{2}$. 6 is greater than $\frac{1}{2}$, therefore Function A has a greater rate of change.

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The rates of change are correctly determined, and Function A is identified as having the greater rate of change. This explanation is complete and correct.

GUIDE PAPER 3

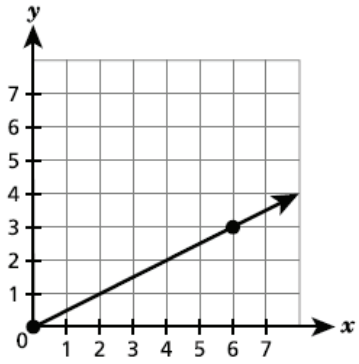
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer.

Explain how you determined your answer.

In function A for every 2 it rises on x it rises 12 for y and in Function B for every 2 it on the x it rises by one for y so Function A has a higher rate of change

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The rates of change are correctly determined, and Function A is identified as having the greater rate of change. This explanation is complete and correct.

GUIDE PAPER 4

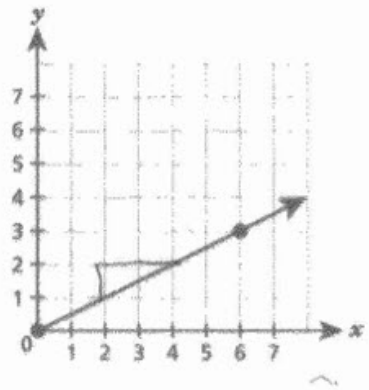
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer. [2]

Explain how you determined your answer.

For A I used the coordinates and did $\frac{y_1 - y_2}{x_1 - x_2}$

For B I followed the line and it went up 1 over 2.

(5, -30) (-3, -18)

B = ½ A = 6

$\frac{-30 - -18}{-5 - -3}$ $\frac{-12}{-2} = 6$

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The rates of change are correctly determined, but Function A is not identified as having the greater rate of change. This response correctly addresses only some elements of the task.

GUIDE PAPER 5

45

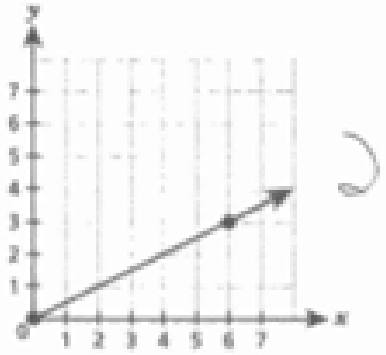
Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

6

FUNCTION B



2

Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer. [2]

Explain how you determined your answer.

Function A's slope is 6 and function B's slope is 2 so A has a greater slope

DO NOT WRITE BEYOND THIS AREA

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The rate of change for Function A is correctly identified, but the rate for Function B is incorrectly identified. Function A is correctly identified as having the greater rate of change. This response correctly addresses only some elements of the task.

GUIDE PAPER 6

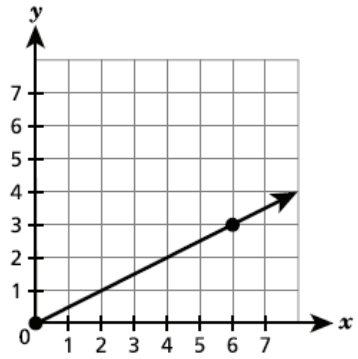
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer.

Explain how you determined your answer.

B rate of change is 3/6 =1/2

A is +2 and x 6

A does because it goes up higher ?

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The rate of change for Function B is correctly determined. Function A is identified as having the greater rate of change; however, this comparison is incomplete as the rate for Function A is not calculated. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

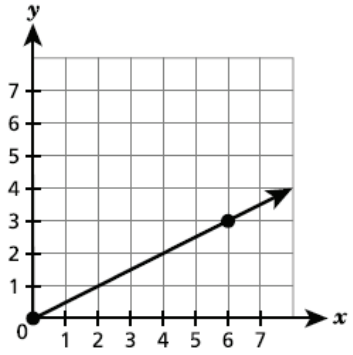
45

Function A and Function B are shown below.

FUNCTION A

x	y
−5	−30
−3	−18
2	12
4	24

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer.

Explain how you determined your answer.

The greater rate change is 6, I did 30/5, 18/3, 12/2, 24/2 and they rounded up to 6

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The constant of proportionality of 6 was calculated for Function A. The rate of change for Function B is not identified. Although the greater rate of change between the two functions is identified, holistically, the explanation is too vague and insufficient to receive any credit.

45

Function A and Function B are shown below.

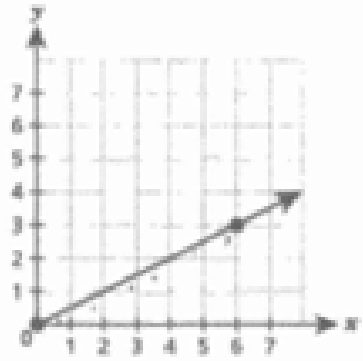
FUNCTION A

x	y	
−5	−30	−12
−3	−18	
2	12	−12
4	24	

−2

−2

FUNCTION B



Which function has a greater rate of change? Be sure to include the rate of change for each function in your answer. [2]

Explain how you determined your answer.

Function A has a greater rate of change because its Rate of Change is 14 while Function B's rate of change is 6.

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although Function A is identified as having the greater rate of change, both rates are incorrectly identified. Holistically, comparing two incorrect rates correctly is insufficient to show any understanding.

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline?

Round your answer to the nearest whole number.

Show your work.

Answer _____ square feet

EXEMPLARY RESPONSE

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline?

Round your answer to the nearest whole number.

Show your work.

$A = \pi r^2$

$A = \pi (6)^2$

$A = 36\pi$

$A = 113.0973355\ldots$

$A \approx 113$

or other valid process

Answer 113 square feet

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline?

Round your answer to the nearest whole number.

Show your work.

r=diameter ÷ 2=12 ÷ 2=6

$A=\pi\ (6)^2$

$A=\pi\ (36)$

A=113

Answer 113 square feet

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The area of the top of the trampoline is correctly calculated and rounded to the nearest whole number. Not providing the decimal value of 36π in the written work does not detract from the demonstration of a thorough understanding. This response is complete and correct.

GUIDE PAPER 2

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline? Round your answer to the nearest whole number. [2]

Show your work.

$A = \pi r^2$
(Area of a circle)

Diameter = 12
Radius = 6

$A = \pi(6)^2$

$A = 113.097$

$A = 113 ft^2$

Answer 113 square feet

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The area of the top of the trampoline is correctly calculated and rounded to the nearest whole number. Rounding the answer for the area to the nearest thousandth, and then rounding to the nearest whole number does not detract from the correct solution and demonstration of a thorough understanding.

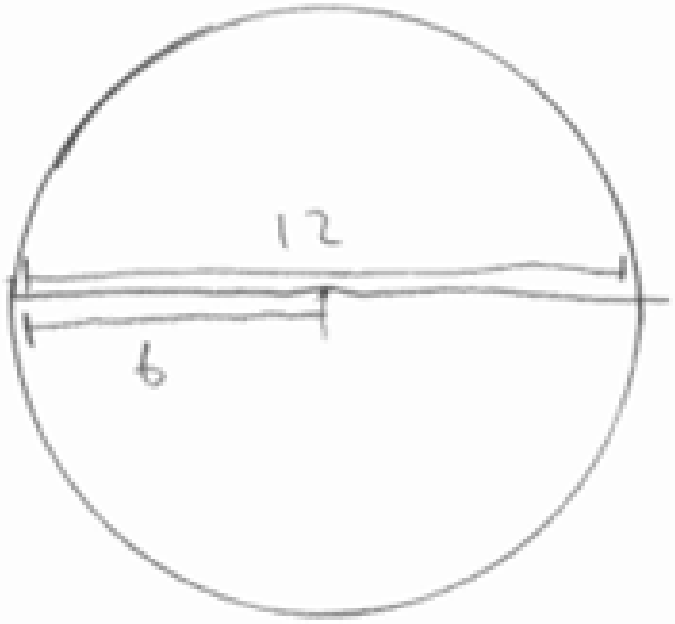
GUIDE PAPER 3

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline? Round your answer to the nearest whole number. [2]

Show your work.

6^2 36π



Answer 113 square feet

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The area of the top of the trampoline is correctly calculated and rounded to the nearest whole number. This response contains sufficient work to show a thorough understanding.

GUIDE PAPER 4

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline? Round your answer to the nearest whole number. [2]

Show your work.

Answer 113 square feet

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The area of the top of the trampoline is calculated using a correct process; however, an inappropriately rounded value of π is used in the calculations, which detracts from demonstrating a thorough understanding. This response correctly addresses only some elements of the task.

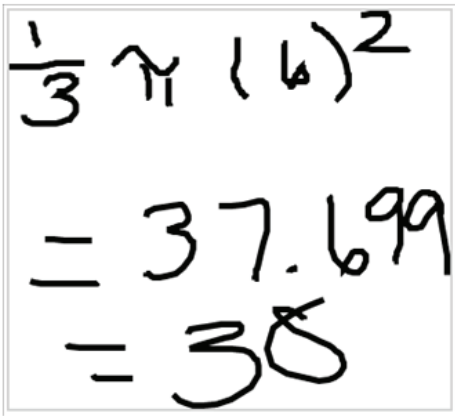
GUIDE PAPER 5

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline?

Round your answer to the nearest whole number.

Show your work.



Answer 38 square feet

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. One third of the area of the top circular surface of the trampoline is calculated. An acceptable rounding process is applied for the obtained answer. This response correctly addresses only some elements of the task.

GUIDE PAPER 6

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline?

Round your answer to the nearest whole number.

Show your work.

$A = \pi r^2$

$A = \pi 12^2$

452sq.ft.

Answer 452 sq. ft. square feet

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The area of the top circular surface of the trampoline is calculated using the correct formula; however, the diameter instead of the radius is substituted for the variable *r* in the equation. The obtained area is correctly rounded to the nearest whole number. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline?

Round your answer to the nearest whole number.

Show your work.

$\pi \times 12 = 37.6991184$

Answer 37.6991184 square feet

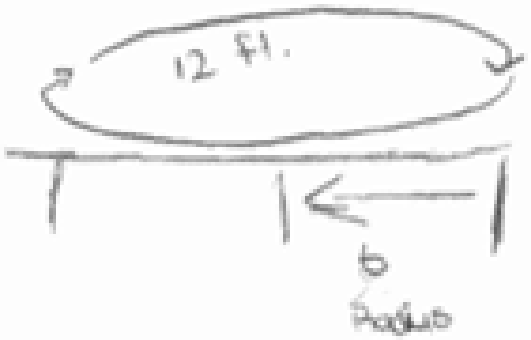
Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect value for r^2 is used to calculate the area of the top circular surface of the trampoline. This obtained answer is incorrectly rounded. Holistically, the explanation is insufficient to show any understanding.

46

The top surface of a trampoline is in the shape of a circle with a diameter of 12 feet. What is the area, in square feet, of the top circular surface of the trampoline? Round your answer to the nearest whole number. [2]

Show your work.



Answer 113 square feet

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although the area of the top of the trampoline is correct; the work is very limited and holistically is insufficient to show any understanding.

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct?

Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer.

Explain how you determined your answer.

EXEMPLARY RESPONSE

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct? Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer.

Explain how you determined your answer.

Yes, the student is correct that the two expressions are equivalent because both expressions are equal to 625.

When dividing exponential terms with the same base, their powers are subtracted.

So, $5^7 / 5^3 = 5^{(7-3)} = 5^4 = 625$.

When multiplying exponential terms with the same base, their powers are added.

So, $5^6 \times 5^{-2} = 5^{(6+(-2))} = 5^4 = 625$.

or other valid explanation

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct?

Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer.

Explain how you determined your answer.

The student is correct. When you divide two exponents such as $\frac{5^7}{5^3}$, you subtract the exponents since you are dividing. When you do that, you get 5^4, which equals 625. When you multiply two exponents such as 5^6 and 5^{-2}, you add the two exponents together since you are multiplying. This then gives you 5^4, which when simplified equals 625, the same as the first expression equals.

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. This response correctly states that the expressions are equivalent. The properties of exponents are correctly explained, and the equivalent simplest form of each expression (625) is included. The explanation is complete and correct.

GUIDE PAPER 2

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct?

Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer.

Explain how you determined your answer.

yes, the student is coorect because when you subtract the exponets for $\frac{5^7}{5^3}$, you get $5^4 = 625$. Then when you add the exponets for $5^6 \times 5^{-2}$, you get 5^4 and get the same answer.

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. This response correctly states that the expressions are equivalent. The properties of exponents are correctly explained, and the equivalent simplest form of each expression (625) is included. The explanation is complete and correct.

GUIDE PAPER 3

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct? Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer. [2]

Explain how you determined your answer.

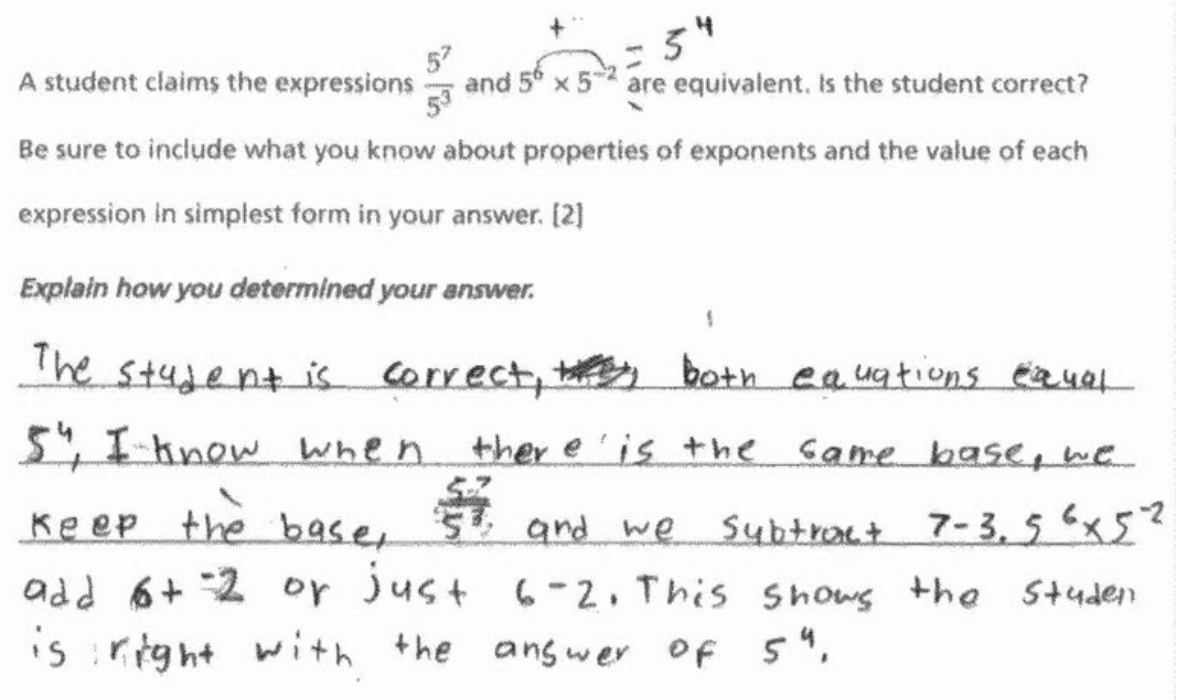
Yes, the student is correct in saying both expressions are equivalent. Because of the rule of dividing exponents that you subtract the exponents (ex: $\frac{7^3}{7^1} = 7^{3-1} = 7^2$), the first expression equals 5^4 (aka. 625). Also, when you make the negative exponent positive in the second expression, you get $\frac{5^6}{5^2}$, which also equals 5^4 or 625.

Score Point 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. This response correctly states that the expressions are equivalent. The properties of exponents are correctly explained, and the equivalent simplest form of each expression (625) is included. The explanation is complete and correct.

GUIDE PAPER 4

47



Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. This response correctly states that the expressions are equivalent. The properties of exponents are correctly explained, but the equivalent simplest form of each expression (625) is not included. This response correctly addresses only some elements of the task.

GUIDE PAPER 5

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct?

Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer.

Explain how you determined your answer.

78125 ÷ 125 = 625
15625 ÷ 25 = 625 The student is correct because they equal to eachother

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. This response correctly states that the expressions are equivalent, and the equivalent simplest form of each expression (625) is included; however, the properties of exponents are not fully explained. This response correctly addresses only some elements of the task.

GUIDE PAPER 6

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct?

Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer. [2]

Explain how you determined your answer.

Yes the student is correct because when you fully solve for both equation you get 5^4

Score Point 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. This response correctly states that the expressions are equivalent, and the correct exponential term (5^4) is determined; however, the properties of exponents are not explained. The equivalent simplest form of each expression (625) is not included. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

47

A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct?

Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer.

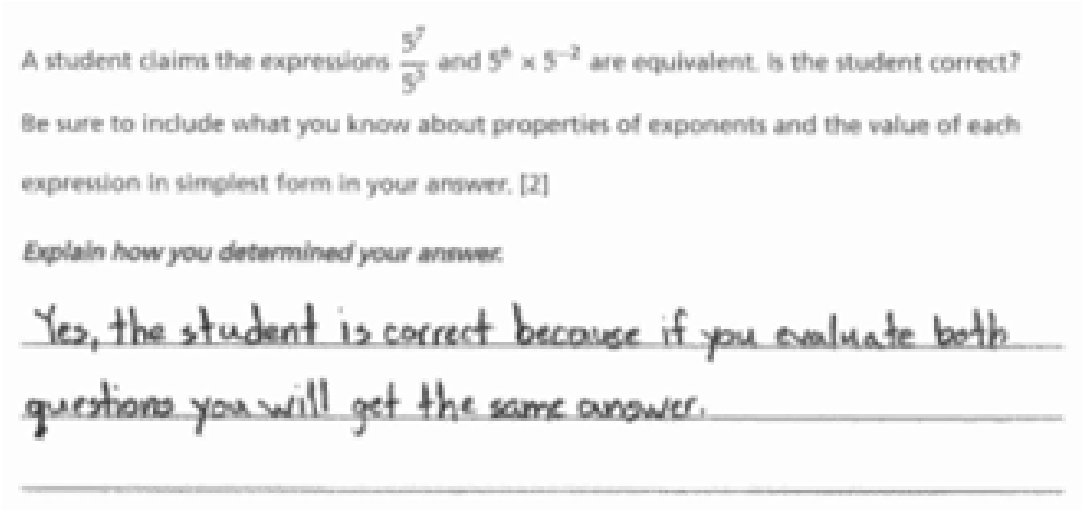
Explain how you determined your answer.

No becasue when doing divison you have to mutiplay the exponts but in mutlpycation you have to add them

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The expressions are incorrectly stated as not being equivalent. The simplest form of each expression (625) is not included. The explanation of the quotient property of exponents is incorrect. Although the explanation to add exponents when multiplying is correct, holistically, the explanation is not sufficient to demonstrate even a limited understanding.

47



A student claims the expressions $\frac{5^7}{5^3}$ and $5^6 \times 5^{-2}$ are equivalent. Is the student correct? Be sure to include what you know about properties of exponents and the value of each expression in simplest form in your answer. [2]

Explain how you determined your answer.

Yes, the student is correct because if you evaluate both questions you will get the same answer.

Score Point 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although the expressions are correctly stated as being equivalent, the simplest form of the expressions is not included, and properties of exponents are not explained. Holistically, the explanation is insufficient to show any understanding.

48

Three different functions are represented by the equation, table, and graph shown below.

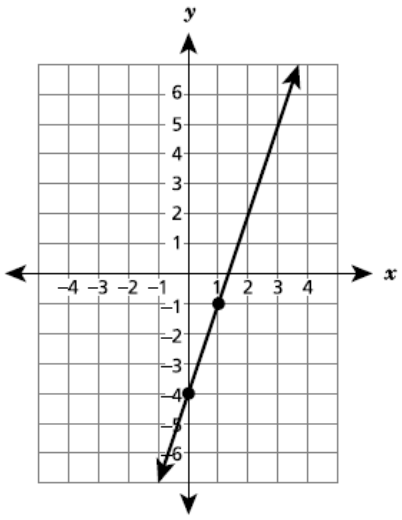
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer.

Explain your answer.

EXEMPLARY RESPONSE

48

Three different functions are represented by the equation, table, and graph shown below.

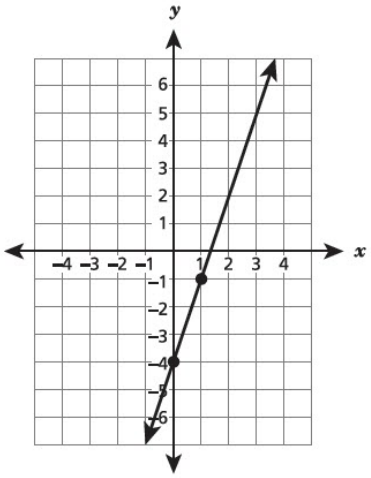
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
–1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer.

Explain your answer.

Function A is a linear function because it is an equation written in a linear slope-intercept form ($y = mx + b$).

or

Function A is a linear function because it will form a straight line when graphed.

Function B is a nonlinear function because it does not have a constant rate of change.

or

Function B is a nonlinear function because when graphed it will not form a straight line.

Function C is a linear function because it is a straight line on a graph.

or

Function C is a linear function because it has a constant rate of change.

or other valid explanation

48

Three different functions are represented by the equation, table, and graph shown below.

FUNCTION A

$y = 2x + 3$

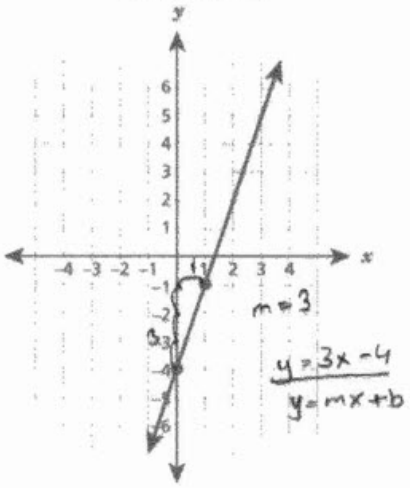
$y = mx + b$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

1, 1, 3

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer. [3]

Explain your answer.

Function A is linear because it is in the form of $y = mx + b$. Function B is not linear because it does not have a constant rate of change. Function C is linear because it is a straight line and can be written in the form of $y = mx + b$.

Score Point 3 (out of 3 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. Functions A and C are correctly identified as linear functions and Function B is correctly identified as a nonlinear function. The explanation correctly describes the linear and nonlinear properties of the functions. This response is complete and correct.

GUIDE PAPER 2

48

Three different functions are represented by the equation, table, and graph shown below.

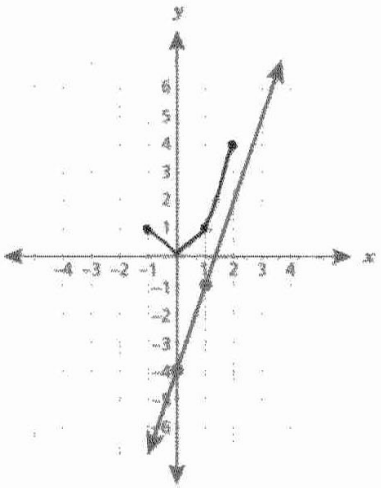
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer. [3]

Explain your answer.

Function A is linear because its rate of change is constant so it goes in a straight line. Function B is nonlinear because its rate of change is inconsistent so it [illegible] not in a straight line. Function C is linear because it goes in a straight line.

Score Point 3 (out of 3 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. Functions A and C are correctly identified as linear functions and Function B is correctly identified as a nonlinear function. The explanation correctly describes the linear and nonlinear properties of the functions. This response is complete and correct.

GUIDE PAPER 3

48

Three different functions are represented by the equation, table, and graph shown below.

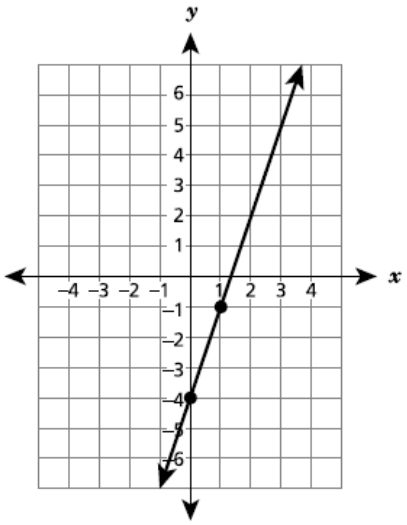
FUNCTION A

$y = 2x + 3$

FUNCTION B

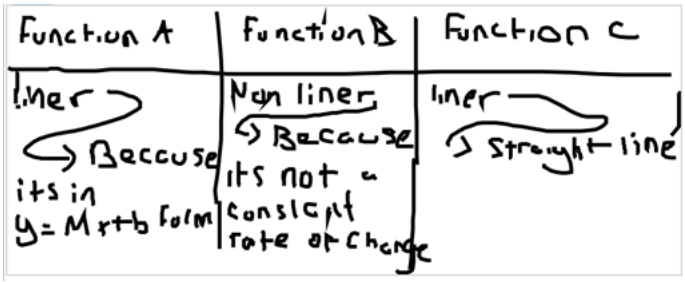
x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer.

Explain your answer.



Score Point 3 (out of 3 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. Functions A and C are correctly identified as linear functions and Function B is correctly identified as a nonlinear function. The explanation correctly describes the linear and nonlinear properties of the functions. This response is complete and correct.

GUIDE PAPER 4

48

Three different functions are represented by the equation, table, and graph shown below.

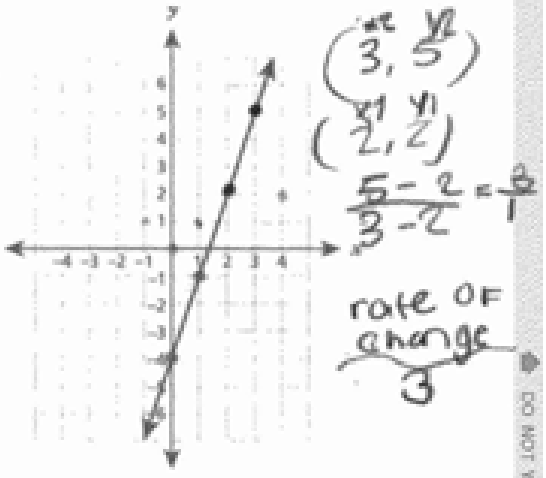
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer. [3]

Explain your answer.

Function A is linear because its in slope intercept form. Function B is non-linear because the rate of change is not constant. Funtion C is linear.

DO NOT WRITE BEYOND THIS AREA

Score Point 2 (out of 3 credits)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. Functions A and C are correctly identified as linear functions and Function B is correctly identified as a nonlinear function. The explanations for Functions A and B correctly describe the linear and nonlinear properties of these functions. Although the rate of change for Function C is correctly calculated as 3, it is not explicitly stated that the slope is constant. This response appropriately addresses most but not all aspects of the task.

GUIDE PAPER 5

48

Three different functions are represented by the equation, table, and graph shown below.

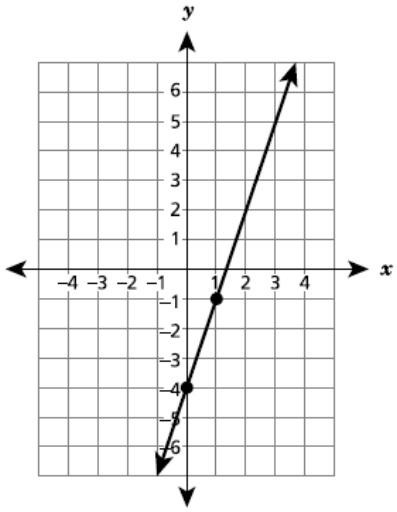
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer.

Explain your answer.

Function A: Linear (there is a slope and a y-intercept, no exponents)

Function B: Nonlinear (does not make a straight line)

Function C: Linear (makes a straight line)

Score Point 2 (out of 3 credits)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. Functions A and C are correctly identified as linear functions and Function B as a nonlinear function. The explanations for Functions B and C are correct. The explanation for Function A is incomplete because it must be stated that the slope is constant. Also, the phrase "*no exponents*" is incorrect as all the terms have exponents of one. This response appropriately addresses most but not all aspects of the task.

GUIDE PAPER 6

48

Three different functions are represented by the equation, table, and graph shown below.

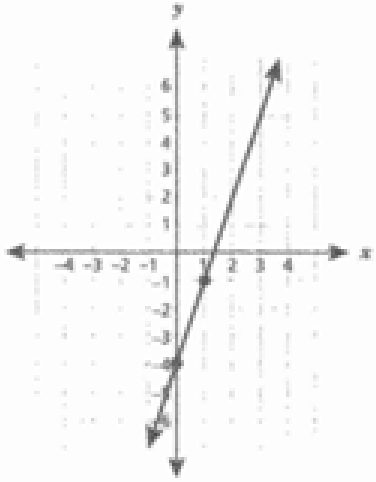
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer. [3]

Explain your answer.

Function A is linear because it is in slope-intercept form.

Function B is non-linear because it does not have a constant rate of change. Function C is non-linear because it does not have a constant rate of change.

Score Point 2 (out of 3 credits)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. Function A is correctly identified as a linear function with a correct explanation. Function B is correctly identified as a nonlinear function with a correct explanation. Function C is incorrectly identified as nonlinear and an incorrect explanation for this function is provided. This response appropriately addresses most but not all aspects of the task.

GUIDE PAPER 7

48

Three different functions are represented by the equation, table, and graph shown below.

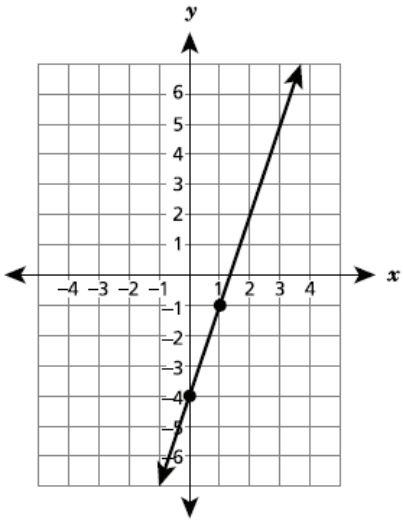
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer.

Explain your answer.

A is linear because it has no answer. B is not linear because its not equal. C is leaner casue its a straight line.

Score Point 1 (out of 3 credits)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. Functions A and C are correctly identified as linear functions and Function B is correctly identified as a nonlinear function. Although the word "*leaner*" is used to describe Function C as linear, it does not detract from the demonstration of understanding. The explanation for C correctly describes the linear property of this function, but the explanations for Functions A and B are incorrect. This response reflects a lack of essential understanding.

48

Three different functions are represented by the equation, table, and graph shown below.

FUNCTION A

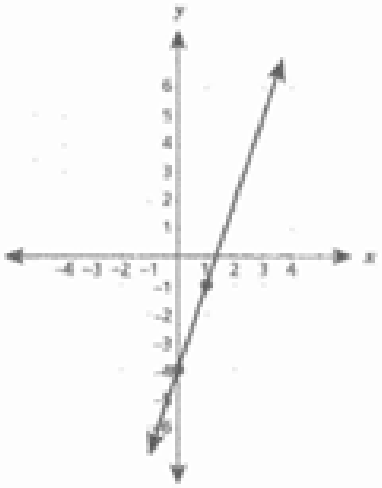
$y = 2x + 3$

$y = 5x$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer. [3]

Explain your answer.

function C and B are linear because C has a straight line if if you put B on a graph it will be straight.

Score Point 1 (out of 3 credits)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. Function C is identified correctly as a linear function and has a correct explanation of a linear property. The identification and explanation of properties for Function B are incorrect and are not addressed for Function A. This response addresses some elements of the task correctly but provides reasoning that is faulty and incomplete.

GUIDE PAPER 9

48

Three different functions are represented by the equation, table, and graph shown below.

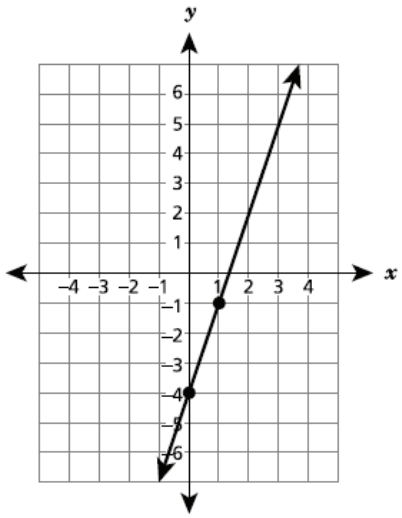
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
–1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer.

Explain your answer.

Funtion A = linear
Function B = Non linear
Function C = linear

Score Point 1 (out of 3 credits)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. All three functions are correctly identified as linear or nonlinear; however, the explanation does not address the properties of the functions. This response reflects a lack of essential understanding of the underlying mathematical concepts.

GUIDE PAPER 10

48

Three different functions are represented by the equation, table, and graph shown below.

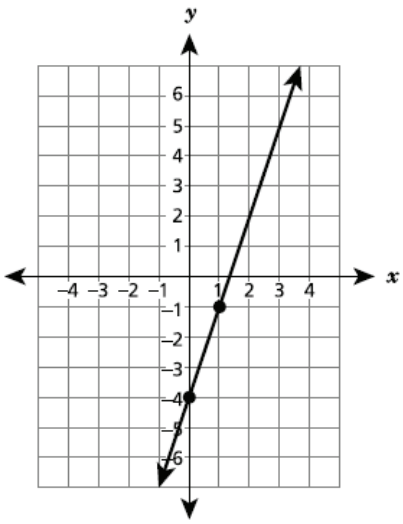
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer.

Explain your answer.

Functon A= nonlinear
Fuction b = nonlinear
fuction c= linear

Score Point 0 (out of 3 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although Function B and Function C are correctly identified, Function A is not, and the properties of the functions are not explained. Holistically, the explanation is insufficient to show any understanding.

48

Three different functions are represented by the equation, table, and graph shown below.

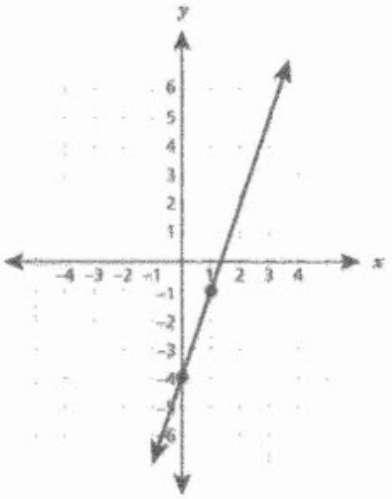
FUNCTION A

$y = 2x + 3$

FUNCTION B

x	y
−1	1
0	0
1	1
2	4

FUNCTION C



Determine whether each function is linear or nonlinear. Be sure to include what you know about the properties of all three functions in your answer. [3]

Explain your answer.

Function A and B is linear because the rate of change is greater and a postive slope. Function C is nonlinear because the slope is negitive. And rate of change is decreuse.

Score Point 0 (out of 3 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although Function A is correctly identified, Function B and Function C are not, and the properties of the functions are incorrect. Holistically, the explanation is insufficient to show any understanding.

Grade 8
Mathematics

Scoring Leader Materials
2023 Training Set

QAI28355