New York State Testing Program

2025

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
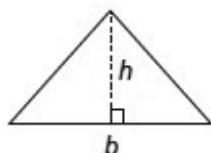
CONVERSIONS ACROSS MEASUREMENT SYSTEMS

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

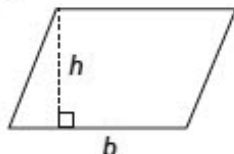1 pound = 0.454 kilogram
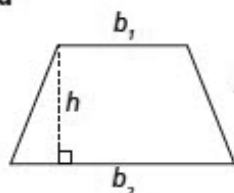1 kilogram = 2.2 pounds

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FORMULAS AND FIGURES

Triangle

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

Parallelogram

$A = bh$

Trapezoid

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

Circle

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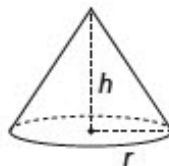$A = \pi r^2$

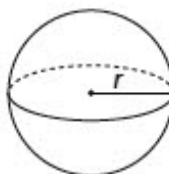**General Prism** $V = Bh$

Right Cylinder
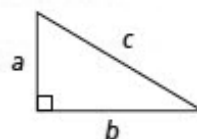

$V = \pi r^2 h$

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).

1-Credit Constructed-Response Mathematics Scoring Policies

1. The student is **not** required to show work for a 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.

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

A table of values for a linear function is shown below.

x	y
−18	−6
−8	−1
0	3
4	5
6	6

What is the rate of change for this function?

Answer _____

39

A table of values for a linear function is shown below.

x	y
−18	−6
−8	−1
0	3
4	5
6	6

What is the rate of change for this function?

Answer $^1/_2$ or 0.5
_____
OR equivalent answer

39

A table of values for a linear function is shown below.

x	y
−18	−6
−8	−1
0	3
4	5
6	6

What is the rate of change for this function?

Answer $\dfrac{1}{2}$

Score Credit 1 (out of 1 credit)

A correct answer is provided.

39

A table of values for a linear function is shown below.

x	y
−18	−6
−8	−1
0	3
4	5
6	6

What is the rate of change for this function?

$$\begin{array}{c|c} -18 & -6 \\ \hline -8 & -1 \end{array}$$

HW +5

$$\frac{5}{10} = \frac{1}{2}$$

The rate of change is $\dfrac{1}{2}$

Answer

Score Credit 1 (out of 1 credit)

A correct answer is provided.

39

A table of values for a linear function is shown below.

x	y
−18	−6
−8	−1
0	3
4	5
6	6

What is the rate of change for this function?

Answer the rate of change on the function is 2

Score Credit 0 (out of 1 credit)

An incorrect answer is provided.

40

A circular dart board has a circumference of 17.75π inches. What is the radius, in inches, of the dart board?

Answer _____ inches

40

A circular dart board has a circumference of 17.75π inches. What is the radius, in inches, of the dart board?

Answer _____8.875_____ inches
OR equivalent answer

40

A circular dart board has a circumference of 17.75π inches. What is the radius, in inches, of the dart board?

8.875

Answer [   ] inches

Score Credit 1 (out of 1 credit)

A correct answer is provided.

40

A circular dart board has a circumference of 17.75π inches. What is the radius, in inches, of the dart board?

$$17.75\pi \div 2 = 8.875$$

Answer $r = 8.875 \text{ ih}$ inches

Score Credit 1 (out of 1 credit)

A correct answer is provided.

40

A circular dart board has a circumference of 17.75π inches. What is the radius, in inches, of the dart board?

Answer | The radius of the dart board is 8.88 inches. | inches

Score Credit 0 (out of 1 credit)

An incorrect answer is provided.

41

David and Lisa each earn money by mowing lawns. They both charge a one-time maintenance fee and an hourly rate. David's total charges, based on the number of hours he mows a lawn, are shown in the table below. The total charges, y, in dollars, for Lisa mowing the lawn for x hours is represented by the equation $y = 6x + 12$.

DAVID'S CHARGES

Time Mowed (hours)	Total Charges (dollars)
0.5	17.50
1	20.00
2	25.00

What is the difference, in dollars, between the one-time maintenance fee David charges and the one-time maintenance fee Lisa charges?

Answer $ _____

41

David and Lisa each earn money by mowing lawns. They both charge a one-time maintenance fee and an hourly rate. David's total charges, based on the number of hours he mows a lawn, are shown in the table below. The total charges, y, in dollars, for Lisa mowing the lawn for x hours is represented by the equation $y = 6x + 12$.

DAVID'S CHARGES

Time Mowed (hours)	Total Charges (dollars)
0.5	17.50
1	20.00
2	25.00

What is the difference, in dollars, between the one-time maintenance fee David charges and the one-time maintenance fee Lisa charges?

Answer $ _____3.00_____

41

David and Lisa each earn money by mowing lawns. They both charge a one-time maintenance fee and an hourly rate. David's total charges, based on the number of hours he mows a lawn, are shown in the table below. The total charges, y, in dollars, for Lisa mowing the lawn for x hours is represented by the equation $y = 6x + 12$.

DAVID'S CHARGES

Time Mowed (hours)	Total Charges (dollars)
0.5	17.50
1	20.00
2	25.00

What is the difference, in dollars, between the one-time maintenance fee David charges and the one-time maintenance fee Lisa charges?

Answer $ 3

Score Credit 1 (out of 1 credit)

A correct answer is provided.

41

David and Lisa each earn money by mowing lawns. They both charge a one-time maintenance fee and an hourly rate. David's total charges, based on the number of hours he mows a lawn, are shown in the table below. The total charges, y, in dollars, for Lisa mowing the lawn for x hours is represented by the equation $y = 6x + 12$.

DAVID'S CHARGES

Time Mowed (hours)	Total Charges (dollars)
0.5	17.50
1	20.00
2	25.00

What is the difference, in dollars, between the one-time maintenance fee David charges and the one-time maintenance fee Lisa charges?

Answer $ $\boxed{3.00}$

Score Credit 1 (out of 1 credit)

A correct answer is provided.

41

David and Lisa each earn money by mowing lawns. They both charge a one-time maintenance fee and an hourly rate. David's total charges, based on the number of hours he mows a lawn, are shown in the table below. The total charges, y, in dollars, for Lisa mowing the lawn for x hours is represented by the equation $y = 6x + 12$.

DAVID'S CHARGES

Time Mowed (hours)	Total Charges (dollars)
0.5	17.50
1	20.00
2	25.00

What is the difference, in dollars, between the one-time maintenance fee David charges and the one-time maintenance fee Lisa charges?

Answer $ 3.50

Score Credit 0 (out of 1 credit)

An incorrect answer is provided.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

_____

_____

_____

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

The decimal equivalent of $\sqrt{1.44}$, or the solution to the equation $x^2 = 1.44$, is 1.2. Since the decimal equivalent of $\sqrt{1.44}$ is a terminating decimal, $\sqrt{1.44}$ is rational.

OR

I know $\sqrt{1.44}$ is rational because it can be represented as a fraction of two integers. The decimal equivalent of $\sqrt{1.44}$, or the solution to the equation $x^2 = 1.44$, is 1.2. The decimal number 1.2, is the same as $\left(\frac{12}{10}\right)$.

OR

The value 1.44 is the same as $\left(\frac{144}{100}\right)$. Determining $\sqrt{\left(\frac{144}{100}\right)}$ is the same as solving the equation $x^2 = \left(\frac{144}{100}\right)$.

Since the solution for x in this equation is $\left(\frac{12}{10}\right)$, because $\left(\frac{12}{10}\right) \times \left(\frac{12}{10}\right) = \left(\frac{144}{100}\right)$, $\sqrt{1.44}$ is rational because it represents a fraction of two integers.

OR Other valid response

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

$\sqrt{1.44}$ is rational because the answer to this is 1.2 which is a terminating decimal.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
- The correct classification of rational is indicated, and a valid explanation is given.

The response is complete and correct.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

It is rational because it can be written as a fraction.

$1.2 = 1\frac{2}{10}$

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
• The correct classification of rational is indicated, and a valid explanation is given.
The response is complete and correct.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

> The number $\sqrt{1.44}$ is rational, since if you solve $\sqrt{1.44}$ it will equal to 1.2. Which we know that an irrational number is a number that cannot be defined as a fraction, which does not apply to 1.2 since your able to put 1.2 into an fraction. So therefore $\sqrt{1.44}$ is an rational number.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
- The correct classification of rational is indicated, and a valid explanation is given.

The response is complete and correct.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

It's rational because It doesn't go on and on forever

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
• The correct classification of rational is indicated; however, the provided reasoning is incomplete.
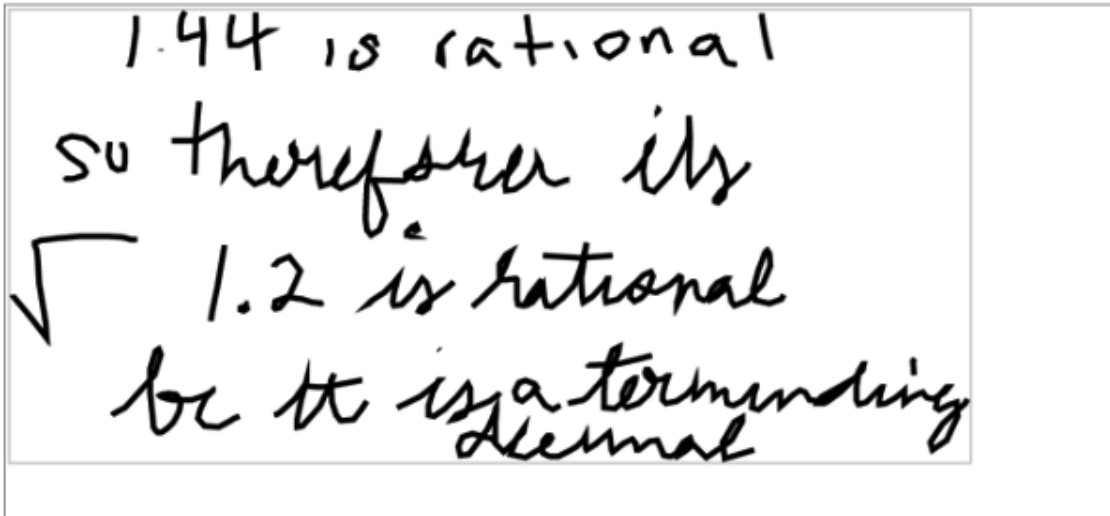This response correctly addresses only some elements of the task.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

1.44 is rational so therefore its $\sqrt{}$ 1.2 is rational bc tt is a terminating decimal

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Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.

- The correct classification of rational is indicated due to the decimal equivalent being a terminating decimal.
- The response incorrectly implies, however, that if a number is rational then the square root of that number is rational.

This response correctly addresses only some elements of the task.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

> rational because it is not repeating or have more than one
> desmal place

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.

• The correct classification of rational is indicated; however, the provided reasoning is unclear.

This response correctly addresses only some elements of the task.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

it is irrational because it is a decimal

Score Credit 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 classification is indicated, and an incorrect reason is provided for the given classification.

This response is incorrect, and, holistically, is insufficient to show any understanding.

42

Classify $\sqrt{1.44}$ as being rational or irrational.

Explain how you know your answer is correct.

1.2

Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

- The correct decimal equivalent is provided; however, no classification is indicated, and no further explanation is given.

Although some elements are correct, holistically, they are not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

43

The equations of two functions are shown below.

> Function A: $y = 3x + 8$

> Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

_____

_____

_____

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

If the equation can be written in the form $y = mx + b$, then the equation represents a linear function, and the graph would be a straight line.

The equation for Function A is already in that form, so it is a linear function.

The equation for Function B has x being squared, so it cannot be written in the form $y = mx + b$. Function B is not linear and its graph will not be a straight line.

OR

The tables below show the output values, y, for a given input value, x.

Function A

x	y
0	8
1	11
2	14
3	17
4	20

Function B

x	y
0	2
1	3
2	6
3	11
4	18

For Function A, the ratio of the change in the output to the change in the input for any pair of points is a constant (3/1). This is not the case for Function B. Since Function A has a constant rate of change, it is a linear function. Function B does not have a constant rate of change, so it is non-linear.

OR Other valid response

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

Function A is linear because it follows the y=mx+b formula. On the other hand, function B is nonlinear because it does not follow the y=mx+b formula and has x to the 2nd power.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
- Both functions are correctly classified, and valid explanations are provided.

This response is complete and correct.

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

Function A is linear because it has a constant rate of change, and it's x value has an exponent of 1. Function B is nonlinear because it does not have a constant rate of change, and it's x value has an exponent other than 1.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
• Both functions are correctly classified, and valid explanations are provided.
This response is complete and correct.

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

> Function A is linear because x has an exponent of invisible one.
> Function B is nonlinear because x has an exponent of 2.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.

• Both functions are correctly classified, and valid explanations are provided.

This response is complete and correct.

GUIDE PAPER 4

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

Function A is linear.
Function B is NOT linear because it has an exponent, and a function with an exponent is non linear.

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.

- Both functions are correctly classified.
- However, no explanation is provided for Function A, and the explanation for Function B is incorrect.

This response correctly addresses only some elements of the task.

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

> Function B is nonlinear because an exponent cannot be on a variable in a linear function.
> Function A is linear because it is written in y=mx + b form.

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.

- Both functions are correctly classified, and a valid explanation is provided for Function A.
- However, the explanation for Function B is incorrect.

This response correctly addresses only some elements of the task.

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

> Function A is linear because the rate of change stays the same for y. Function B is nionlinear because the rate of change does not stay the same for y.

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- Both functions are correctly classified.
- However, incomplete explanations are provided for Function A and Function B.

This response correctly addresses only some elements of the task.

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

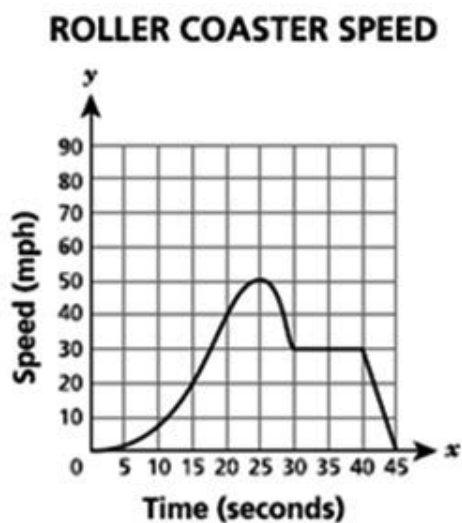|	
Function A - Linear, Y = 3x + 8	11
Function B - Linear, Y = x^2 + 2	3

Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
- Function A is correctly classified.
- However, Function B is incorrectly classified, and the explanations provided are incorrect.

Although some elements are correct, holistically, they are not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

43

The equations of two functions are shown below.

Function A: $y = 3x + 8$

Function B: $y = x^2 + 2$

Classify each function as linear or nonlinear.

Explain how you determined your answer.

Function A and B are linear because they need to find a answer for X

Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
- Function A is correctly classified.
- However, Function B is incorrectly classified, and the explanation provided is incorrect.

Although some elements are correct, holistically, they are not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

_____

_____

_____

EXEMPLARY RESPONSE

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

The speed of the roller coaster is staying a constant 30 mph between the time interval of 30 and 40 seconds.

I know this because the section of the graph that shows a constant rate of change of zero is the horizontal line.

For those 10 seconds, there is no change in the speed, so the constant rate of change for that interval (the slope of the horizontal line), or the change in y over the change in x, is $\left(\frac{0}{10}\right)$ or 0.

OR Other valid response

44

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

The roller coaster is at a constant rate from 30 to 40 seconds. You can tell because there is a horizantal line during that time period, although the speed is still at 30 mph so you know the roller coaster is moving. The horizantal line tells how during that one time period time was going on, yet the speed stays the same.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
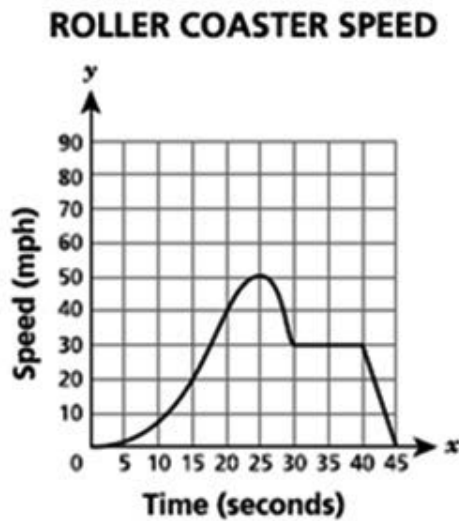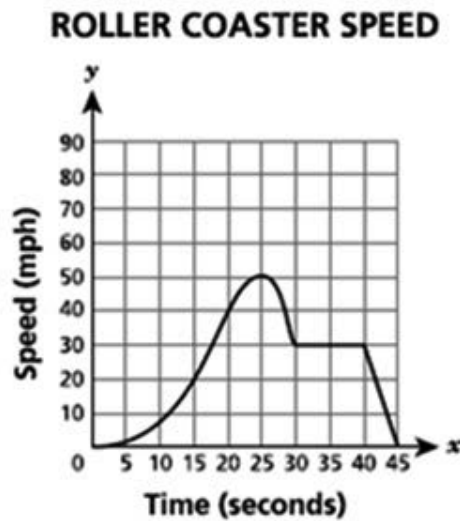
- The time interval is correctly identified and a valid explanation with the constant speed for the interval is provided.

This response is complete and correct.

44

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

> The time of when the roller coaster was at constant speed is from (30,30) to (40,30) which the speed stays the same at 30 mph and changing of time/seconds being from 30 seconds to 40 seconds.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
- The time interval is correctly identified and a valid explanation with the constant speed for the interval is provided.

This response is complete and correct.

44

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

During the 30-40 second interval, the speed remains 30 mph.

Score Credit 2 (out of 2 credits)

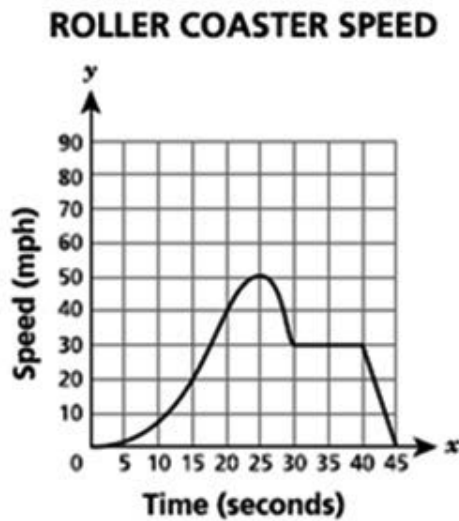This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.

- The time interval is correctly identified and a valid explanation with the constant speed for the interval is provided.

This response is complete and correct.

GUIDE PAPER 4

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

> it is constant going 30 mph because on the graph is shows that
> the roller coaster was a striaght line which means it was going
> at a constant rate

Score Credit 1 (out of 2 credits)

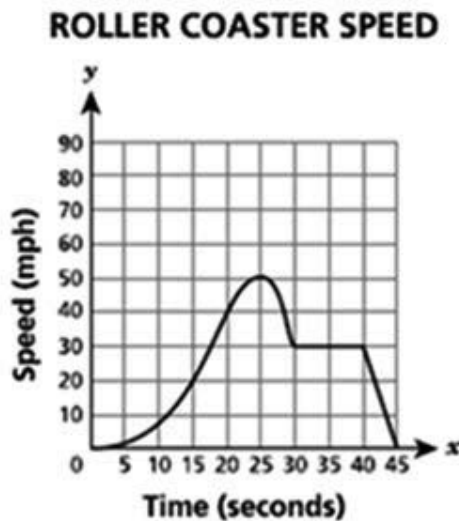This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- The constant speed is correctly identified, and a reason for how the graph can be used to identify when constant speed occurs is given, but it is not fully explained.
- Additionally, the time interval for when the constant speed occurs is not provided.

This response correctly addresses only some elements of the task.

GUIDE PAPER 5

44

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

From 30 seconds to 40 seconds is when the speed is constant. It does not go up, nor down. Constant speed is when it is the same speed for a duration of time.

Score Credit 1 (out of 2 credits)

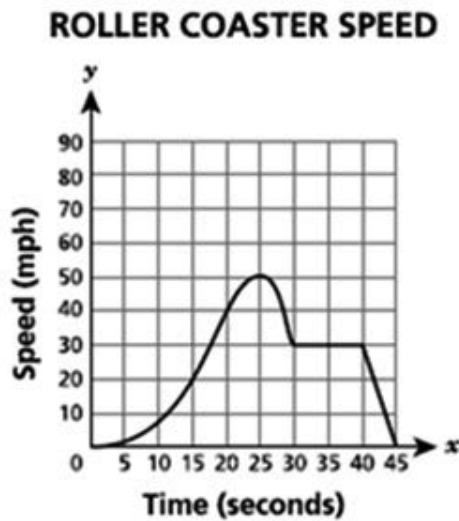This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- The time interval in which constant speed occurs is correctly identified and explained.
- However, the constant speed is not provided.
This response correctly addresses only some elements of the task.

44

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.
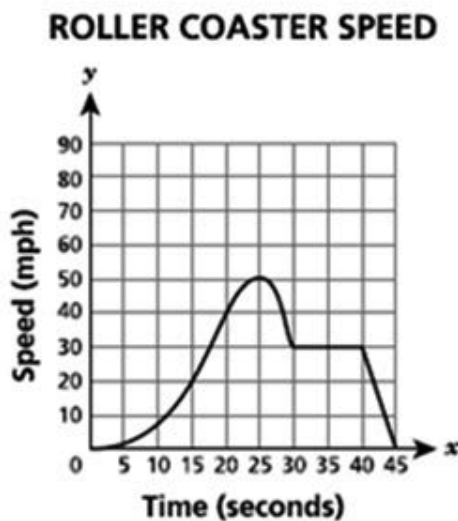
Explain your answer.

> On the graph, the seconds in speed where the roller coaster was constant was during 30-40 seconds. Constant speed is technically when the line on the graph stays the same or does not change at all. So the constant speed, in miles per hour, is 30-40 seconds.

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- The time interval is identified; however, the explanation as to how the nature of the line can be used to identify this interval is unclear.
- The constant speed is incorrectly stated as being the time interval.

This response correctly addresses only some elements of the task.

44

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

30

Score Credit 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 speed is provided.
- However, a time interval and explanation for when this constant speed occurs are not provided.

Holistically, this response is insufficient to show any understanding.

44

The graph shown below represents the time and speed of a roller coaster over the course of the entire ride.

ROLLER COASTER SPEED

Based on the graph, during what interval of time, in seconds, is the speed, in miles per hour, of the roller coaster constant? Be sure to include what the constant speed is, in miles per hour, for that interval in your answer.

Explain your answer.

The speed is 50mph, the time is 25 seconds

Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

- The greatest speed reached by the rollercoaster and the length of time it took the rollercoaster to achieve this speed is incorrectly provided as an answer.

The response is insufficient to show any understanding.

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

Answer $x = $ _____

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

$$\left(\frac{2}{3}\right)(3x + 9) = x - 4$$
$$2x + 6 = x - 4$$
$$x + 6 = -4$$
$$x = -10$$

OR Other valid process

Answer $x =$ _____ **-10** _____

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

2/3(3x+9)=x-4
2x+6=x-4
   -x   -x
x+6=-4
 -6 -6
x=-10

Answer $x =$ -10

Score Credit 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.

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

Answer $x =$ -10

Score Credit 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.

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

$$\frac{2}{3}(3x + 9) = x - 4$$
$2(3x+9) = 3x-12$
$6x+18 = 3x-12$
$3x = -30$
$x = -10$

Answer $x =$ -10

Score Credit 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.

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

$$\frac{2}{3}(3x + 9) = x - 4$$

$2x + 3 = x - 4$

$-x -x$
_____

$x + 3 = -4$

$-3 -3$

$x = -7$

Answer $x = $ -7

Score Credit 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 when solving for x.
- However, a calculation error occurs when distributing ($\frac{2}{3} \times 9 \neq 3$), resulting in an incorrect solution.

This response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 5

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

2/3(3x+9)
2x+6=x-4
-x   -x
1x+6=4
   -6 -6
1x=-2
1x ÷ 1= x
-2 ÷ 1 = -2
x= -2

Answer $x =$ -2

Score Credit 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 when solving for x.
- However, a sign error occurs with the - 4 term, resulting in an incorrect solution.

This response contains an incorrect solution but applies a mathematically appropriate process.

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

$$\frac{2}{3}(3x + 9) = x - 4$$
$$2x + 6 = x - 4$$
$$3x = 2 \qquad x = 1.5$$

Answer $x =$ 1.5

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.

- The distribution is performed correctly.
- However, errors occur when combining like terms, and an incorrect order of division is performed, resulting in an incorrect solution.

This response correctly addresses only some elements of the task.

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

2/3 (3x + 9) = x -4
2/3 9x + = x -4
　　-9x = -9x -4
　　2/3 + = -9x +4
4 2/3 = x

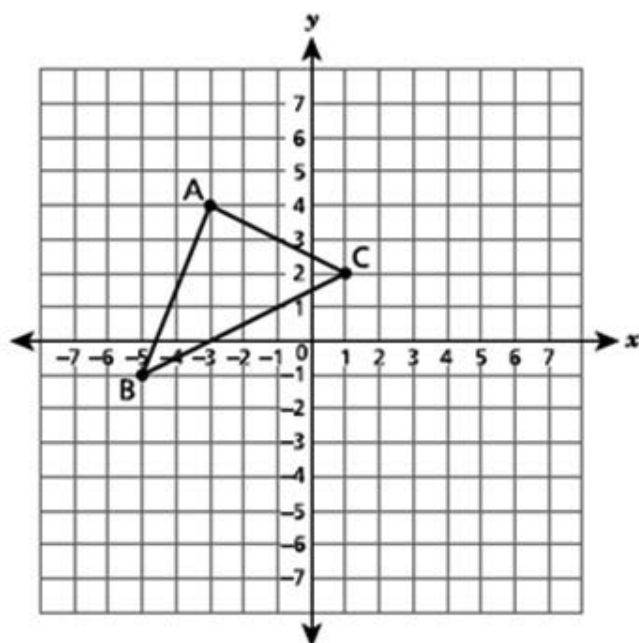*Answer* $x =$ 　$4\dfrac{2}{3} = x$

Score Credit 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 procedure is used to determine an incorrect solution.

Holistically, this response shows no overall understanding of the task.

45

An equation is shown below.

$$\frac{2}{3}(3x + 9) = x - 4$$

What value of x will make the equation true?

Show your work.

$$\frac{2}{3}(3x+9) = x-4 \quad \textcircled{2}$$
$$\frac{2}{3}(3x+9) = 6$$
$$6 - 2 = \textcircled{4}$$

Answer $x =$ 2

Score Credit 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 procedure is used to determine an incorrect solution.

Holistically, this response shows no overall understanding of the task.

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the *y*-axis to create triangle A′B′C′.

What will be the coordinates of vertex A′ ?

Explain how you determined your answer.

_____

_____

_____

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the *y*-axis to create triangle A′B′C′.

What will be the coordinates of vertex A′ ?

Explain how you determined your answer.

The coordinates of A′ will be (3,4).

When reflecting a point over the *y*-axis,
the distance from the reflected point to the *y*-axis remains the same,
but the reflected point will be on the opposite side of the *y*-axis.
The *y* value stays the same.

OR

Since $(x, y) \longrightarrow (-x, y)$ for a reflection over the y-axis,
then A(-3, 4) --> A′(3, 4).

OR Other valid response

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the y-axis to create triangle A′B′C′.

What will be the coordinates of vertex A′ ?

Explain how you determined your answer.

> The coordinates of A will be (3,4). I know this because if something is reflected over either axis the absolute value of the numbers doesn't change, it changes if the numbers are positive or negative. In this case, point A is reflected over the Y-axis causing it to be in quadrant 1 and cooridantes in quadrant 1 can only be positive.

Score Credit 2 (out of 2 credits)

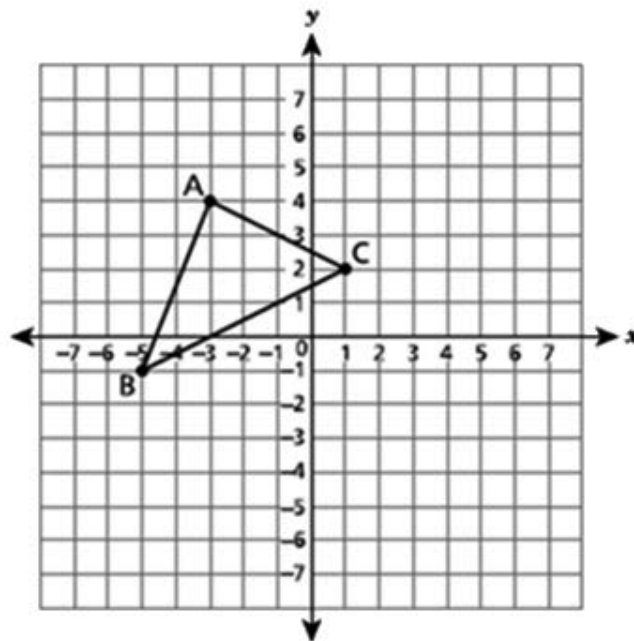This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.

• The coordinates of A' are correctly stated, and a valid explanation is provided.

This response is complete and correct.

GUIDE PAPER 2

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the *y*-axis to create triangle A′B′C′.

What will be the coordinates of vertex A′ ?

Explain how you determined your answer.

> The coordinates of vertex A' will be (3,4) because the rule for reflection over y-axis is
> (x,y)->(-x,y), also known as opposite (x) same (y)

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
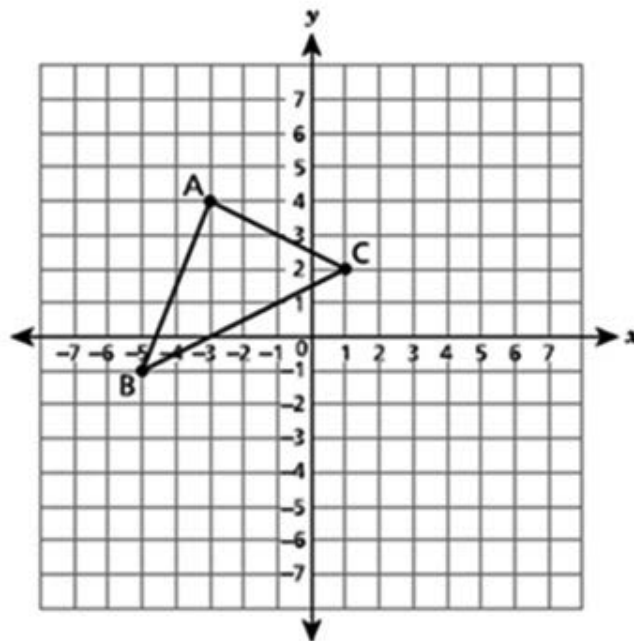- The coordinates of A' are correctly stated, and a valid explanation is provided.

This response is complete and correct.

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the y-axis to create triangle A′B′C′.

What will be the coordinates of vertex A′ ?

Explain how you determined your answer.

Reflections across the y-axis negates the x value of a point. Therefore, point A's cordinants of (-3,4) would become (3,4) after a reflection, forming point A'

Score Credit 2 (out of 2 credits)

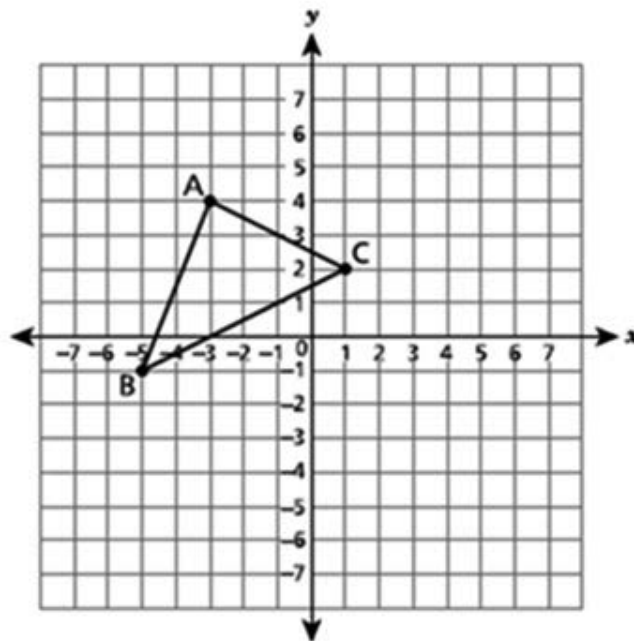This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.

- The coordinates of A' are correctly stated, and a valid explanation is provided.

This response is complete and correct.

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the y-axis to create triangle A′B′C′.

What will be the coordinates of vertex A′ ?

Explain how you determined your answer.

The coordinates of vertex A' will be (2,4) because the coordinates of vertex A is (-2,4) I know when reflected over the y-Axis you change the x value from a negative to a positive or a positive to a negative

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Score Credit 1 (out of 2 credits)

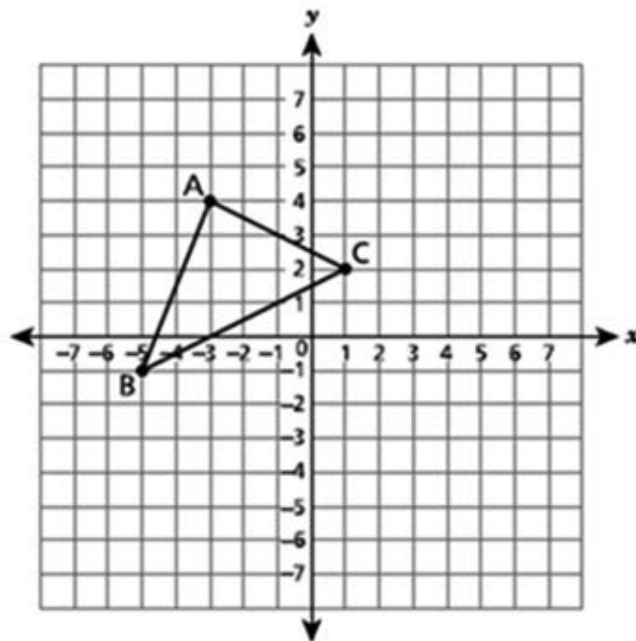This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- A valid explanation to describe how reflections affect the coordinates of points is provided.
- However, incorrect original coordinates of (-2,4) were used, resulting in an incorrect solution.

This response correctly addresses only some elements of the task.

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the *y*-axis to create triangle A'B'C'.

What will be the coordinates of vertex A' ?

Explain how you determined your answer.

> You reflect over the y-axis and your new coordinates for A'
> will be (3,4) you reflect and the numbers flip.

Score Credit 1 (out of 2 credits)

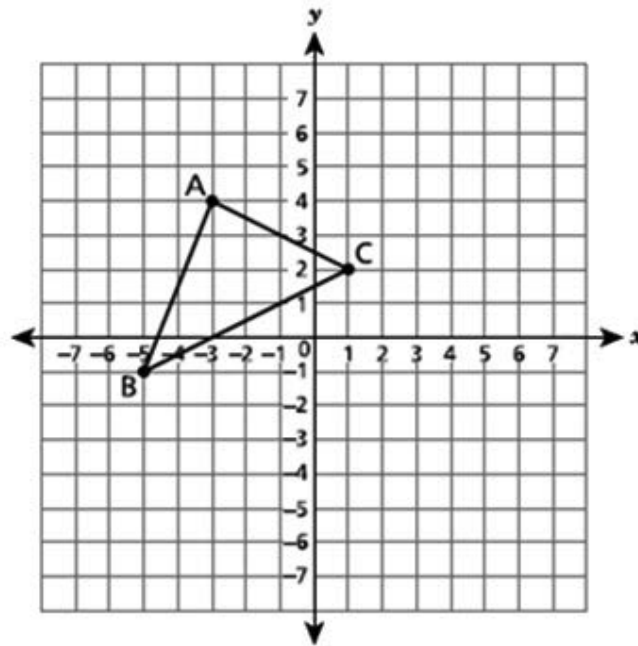This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- The coordinates of A' are correctly stated.
- However, the explanation provided is incorrect.

This response correctly addresses only some elements of the task.

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the y-axis to create triangle A'B'C'.

What will be the coordinates of vertex A' ?

Explain how you determined your answer.

(3,4)
I counted over

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- The coordinates of A' are correctly stated.
- However, the explanation provided is incomplete.

This response correctly addresses only some elements of the task.

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the *y*-axis to create triangle A'B'C'.

What will be the coordinates of vertex A' ?

Explain how you determined your answer.
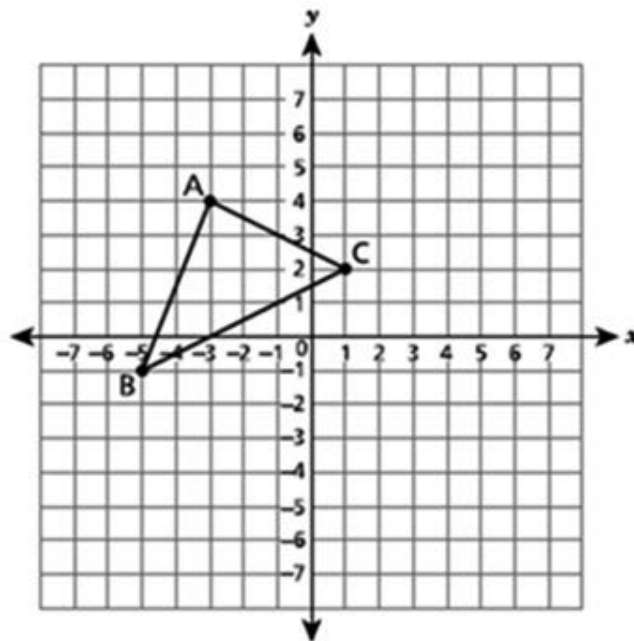
A: (-3, 4) → A': (4, 3)

Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

- Incorrect coordinates are stated for A'.
- No explanation is provided.

This response is incorrect, and, holistically, is insufficient to show any understanding.

46

Triangle ABC is graphed on the coordinate plane shown below. Triangle ABC will be reflected over the *y*-axis to create triangle A′B′C′.

What will be the coordinates of vertex A′ ?

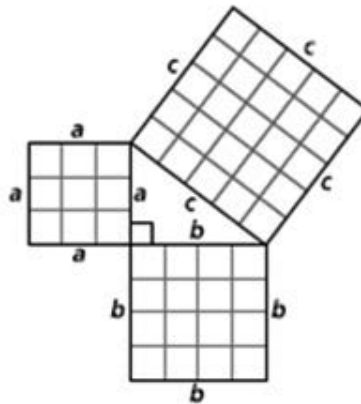*Explain how you determined your answer.*

-3,-4
i counted

Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
- Incorrect values are stated for the coordinates of A', and an incomplete explanation is provided.

This response is incorrect, and, holistically, is insufficient to show any understanding.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$$5^2 + 4^2 = 3^2$$

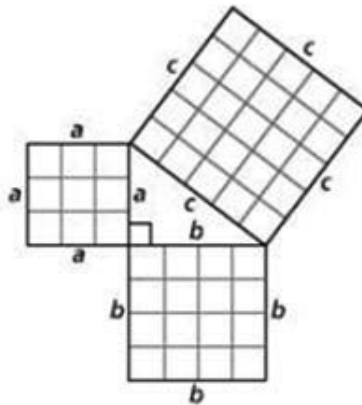$$25 + 16 \neq 9$$

$$41 \neq 9$$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

_____

_____

_____

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$$5^2 + 4^2 = 3^2$$

$$25 + 16 \neq 9$$

$$41 \neq 9$$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

The student made an error
when they substituted the values into the Pythagorean Theorem.
The legs, *a* and *b*, should have been 3 and 4;
the hypotenuse should be 5 because it is across from the right angle.
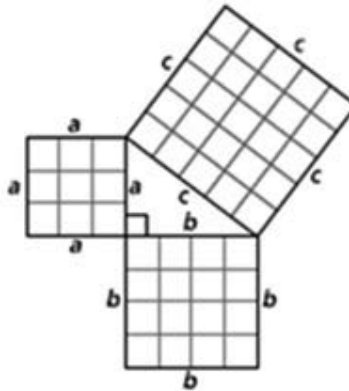The equation and work should be:

$$3^2 + 4^2 = 5^2$$
$$9 + 16 = 25$$
$$25 = 25$$

OR *Other valid response*

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$$5^2 + 4^2 = 3^2$$

$$25 + 16 \neq 9$$

$$41 \neq 9$$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

The error they made was putting the hypotenuse in the incorrect spot. C represents the hypotenuse in that equation and they substitued 5 which is the length of the hypotenuse for A. The correct stepsneeded to show the relationship is:

$$a^2 + b^2 = c^2$$
$$3^2 + 4^2 = c^2$$
$$9 + 16 = c^2$$
$$\sqrt{25} = \sqrt{c^2}$$
$$5 = c$$

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
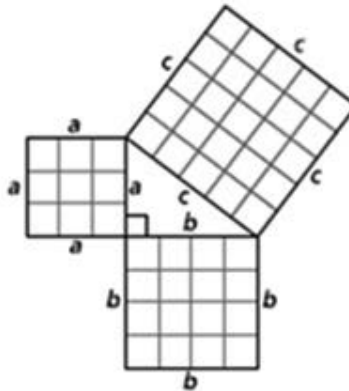
- The error is correctly identified and explained, and the steps have been provided to show how the correct relationship among the lengths of the three sides holds true.

This response is complete and correct.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$$5^2 + 4^2 = 3^2$$

$$25 + 16 \neq 9$$

$$41 \neq 9$$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

> The error was made in step 2. When squared, the side opposite from the right triangle will always be bigger then the two legs. It should of been $3^2 + 4^2 = 5^2$. Then it would of been 9+ 16= 25. And 9+16 does equal to 25.

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
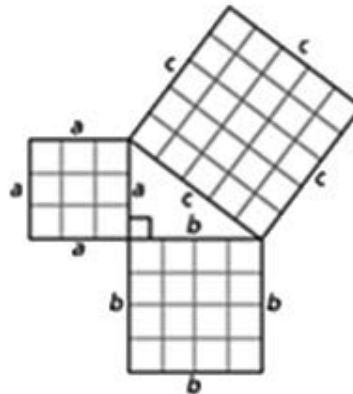
- The error is correctly identified and explained, and the steps have been provided to show how the correct relationship among the lengths of the three sides holds true.

This response is complete and correct.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$5^2 + 4^2 = 3^2$

$25 + 16 \neq 9$

$41 \neq 9$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

The student confused the value of each variable. The students puts 5 as (a) and 3 as (c).

The arrangment should have been $3^2 + 4^2 = 5^2$. The pythagorean theorom showed how there are three sides of a right triangle, and in order to find of one the three missing value of a side, the relationship would be $a^2 + b^2 = c^2$ in which (b) is the base, (a) is the height and (c) is the last side.

EX: $3^2 + 4^2 + 5^2$
9+16=25
25=25

Score Credit 2 (out of 2 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
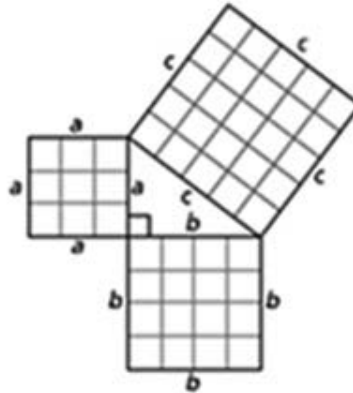
- The error is correctly identified and explained, and the steps have been provided to show how the corrected relationship among the lengths of the three sides holds true.
- Although the Pythagorean relationship is incorrectly stated in the first line of the corrected steps, the correct relationship is referenced throughout the response.

This response contains sufficient work to demonstrate a thorough understanding.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$5^2 + 4^2 = 3^2$

$25 + 16 \neq 9$

$41 \neq 9$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

the studint shod have done $3^2 + 4^2 = 5^2$ because the 5 is the value of the longist langhth.

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
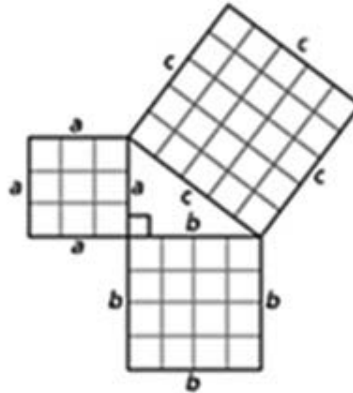
- The error is correctly identified and explained; however, the steps needed to show how the corrected relationship among the lengths of the three sides holds true are not provided.

This response correctly addresses only some elements of the task.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$$5^2 + 4^2 = 3^2$$

$$25 + 16 \neq 9$$

$$41 \neq 9$$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

3^2 + 4^ =5^2
9 + 16 = 25
25=25

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
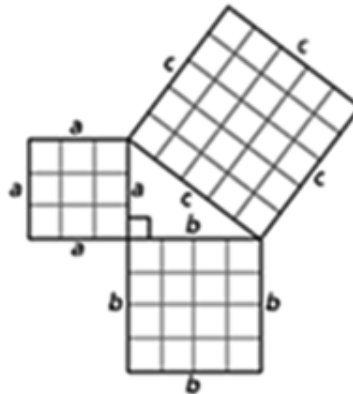
- The steps have been provided to show how the correct relationship among the lengths of the three sides holds true.
- However, the error is not fully explained.

This response correctly addresses only some elements of the task.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$$5^2 + 4^2 = 3^2$$

$$25 + 16 \neq 9$$

$$41 \neq 9$$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

The student subsituted the wrong numbers into the formula. Insted of $5^2 + 4^2 = 3^2$ the studet should have susituted the numbers from the diagram into the formula as $3^2 + 4^2 = 5^2$ because the amount of units in side c in the diagram is 5, the amount of units side a has is 3, and the amoutn of units in side b is 4 which is correct in the students work. If you solve $3^2 + 4^2 = 5^2$ on both sides you would get 25=25.

Score Credit 1 (out of 2 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
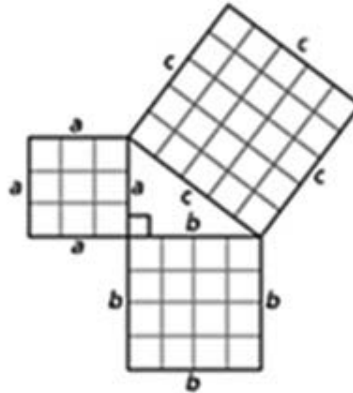
- The error is correctly identified and explained; however, the steps needed to show how the correct relationship among the lengths of the three sides holds true is incomplete.

This response correctly addresses only some elements of the task.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$$5^2 + 4^2 = 3^2$$

$$25 + 16 \neq 9$$

$$41 \neq 9$$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

Explain your answer.

> The student made the error because they had Pythagorean theorem as a2 + b2 = c2 when it is supposed to be c2=a2+b2. They need to solve it this way to get the correct answer.
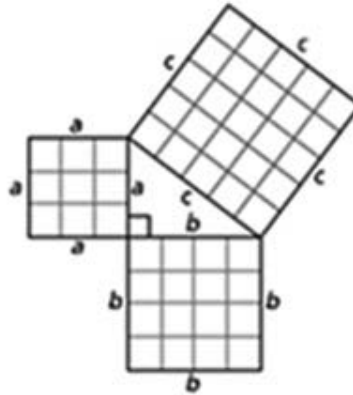
Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
- An irrelevant explanation is provided, and no corrected steps are provided.

Holistically, this response shows no overall understanding of the task.

47

A student used the diagram shown below to support their work in representing the relationship among the lengths of the sides, in units, of a right triangle.

The student then showed how the diagram relates to the Pythagorean theorem, but made an error as shown below.

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

$5^2 + 4^2 = 3^2$

$25 + 16 \neq 9$

$41 \neq 9$

What is the error that the student made and what are the correct steps needed to show how the Pythagorean theorem shows the relationship among the lengths of the sides, in units, of the right triangle?

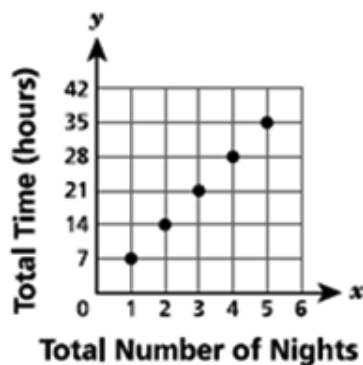*Explain your answer.*

$$5^2 + 4^2 = 3^2$$

Score Credit 0 (out of 2 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

- The error is not identified, and the one step provided is incorrect.

Holistically, this response shows no overall understanding of the task.

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.
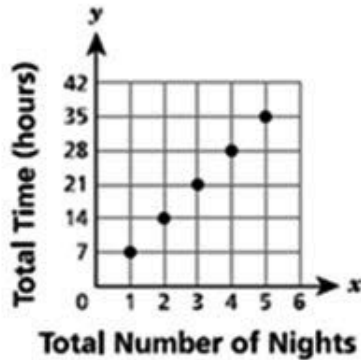
Explain how you determined your answer.

_____

_____

_____

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Time (hours) vs Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

To determine who gets more sleep per night, I used the slope formula, $(y2 - y1)/(x2 - x1)$, and substituted in values from the graph and table for each person.
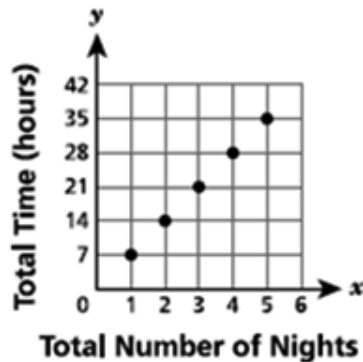
Kaley: $\frac{14-7}{2-1} = \frac{7}{1} = 7$ hours of sleep per night.

Mark: $\frac{27-18}{3-2} = \frac{9}{1} = 9$ hours of sleep per night.

Since 9 is more than 7, I determined Mark gets more sleep per night.

OR Other valid response

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Time (hours)

Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

$$kayleys = \frac{14-7}{2-1} = \frac{7}{1} = 7 \text{ hours of sleep every night}$$

$$marks = \frac{27-18}{3-2} = \frac{9}{1} = 9 \text{hours of sleep every night}$$

$7 < 9$

mark gets more hours of sleep because he gets nine hours and kayle gets 7 and 9 is bigger than 7 there for makr gets more sleep

Score Credit 3 (out of 3 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.

- Mark is correctly identified as getting more hours of sleep per night, and a valid explanation is provided to support the claim.
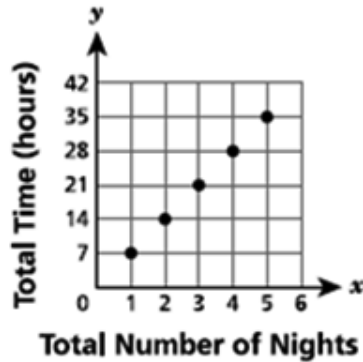
This response is complete and correct.

GUIDE PAPER 2

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

Kaley
7 hours
1 night

Mark   9 hours
$\frac{27}{-18}$ $\frac{3}{-2}$ 1 night
$\frac{}{9}$ $\frac{}{1}$

Mark gets 2 more hours of sleep than Kaley.

Score Credit 3 (out of 3 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.
- Mark is correctly identified as getting more hours of sleep per night, and a valid explanation is provided to support the claim.
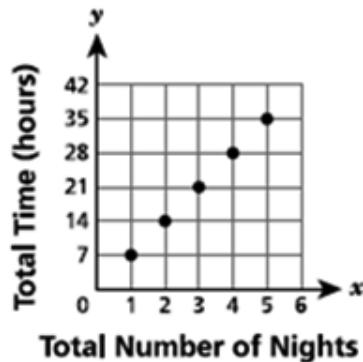
This response is complete and correct.

GUIDE PAPER 3

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Time (hours) vs Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

> Mark gets more sleep per night than Kaley. On the graph representing Kaley's sleep time, you can see that at the 1 night mark on the bottom, Kaley got 7 hours of sleep. With Mark's graph you divide 18 by 2 to get his total number of sleep for 1 night instead of 2. In the end, you get 9 hours of sleep. Mark gets more sleep per night than Kaley by 2 hours.

Score Credit 3 (out of 3 credits)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task.

- Mark is correctly identified as getting more hours of sleep per night, and a valid explanation is provided to support the claim.
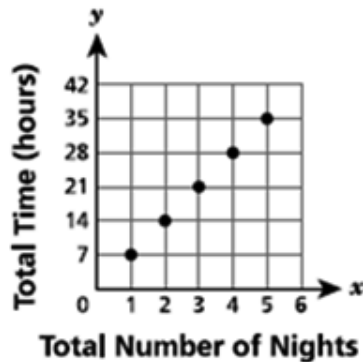
This response is complete and correct.

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Time (hours) / Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

> Mark gets more sleep because every 2 nights he gets 18 hours of sleep and every 2 nights Kaley gets 14 hours of sleep so mark gets 4 more hours

---

Score Credit 2 (out of 3 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.

- Mark is correctly identified as getting more hours of sleep per night.
- However, the explanation is incomplete. The rates per night are not addressed, and a comparison of who gets more sleep in two nights is provided.
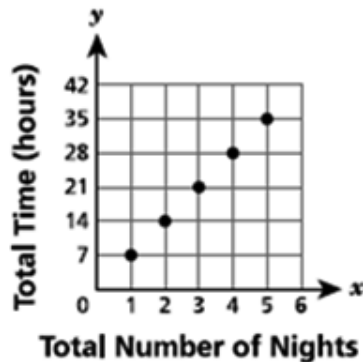
This response appropriately addresses most, but not all, aspects of the task.

GUIDE PAPER 5

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

For kayley, it shows that every night she gets 7 hours of sleep for one night. For mark, if we divide the total time and the total number of nights we can get the unit rate. So mark gets 9 hours of sleep because 18 divided by 2 is 9. So mark gets 1 more hour of sleep then kaley.

Score Credit 2 (out of 3 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.

- Mark is correctly identified as getting more hours of sleep per night, and unit rates for each person are correctly explained.
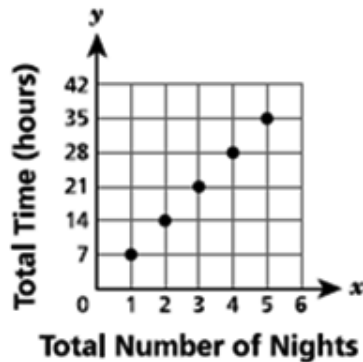- However, the explanation includes an incorrect statement that "mark gets 1 more hour of sleep then kaley."

This response reflects a minor misunderstanding of the underlying mathematical concepts and/or procedures.

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

Kayley: Mark:
y=7x   y=9x

Mark gets more sleep because he sleeps 9 hours per night and Kayley sleeps 7 hours per night

Score Credit 2 (out of 3 credits)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task.
- Mark is correctly identified as getting more hours of sleep per night, and rates per night are provided and compared using equations.
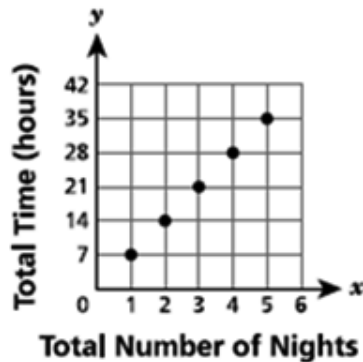- However, the explanation is incomplete. It is unclear how the rates per night were determined.

This response appropriately addresses most, but not all, aspects of the task.

GUIDE PAPER 7

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

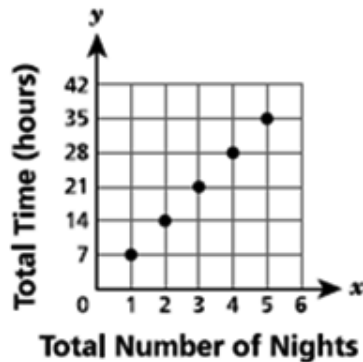mark gets more sleep because 2 divided by 18 is 9, 9 hours per day

---

Score Credit 1 (out of 3 credits)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task.
- Mark is correctly identified as getting more hours of sleep per night.
- However, the explanation is incomplete. Kaley's unit rate is not provided, and an incorrect order of division is used to determine Mark's unit rate.

This response addresses some elements of the task correctly but provides reasoning that is faulty and incomplete.

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

mark gets more sleep per night 9 hours

Score Credit 1 (out of 3 credits)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task.

- Mark is correctly identified as getting more hours of sleep per night.
- However, the explanation is incomplete, it is unclear how Mark's unit rate was determined, and Kaley's unit rate is not addressed.
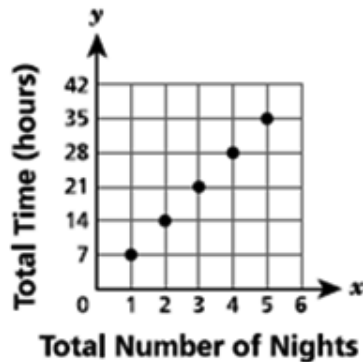
This response addresses some elements of the task correctly but exhibits multiple flaws related to misunderstanding of important aspects of the task.

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

Mark gets more sleep per night because he has a higher rate of change in his sleep schedule.

Score Credit 1 (out of 3 credits)

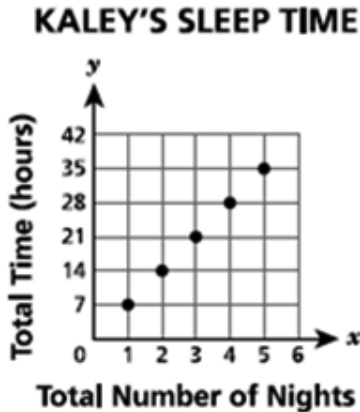This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task.

• Mark is correctly identified as getting more hours of sleep per night, and an explanation is provided to demonstrate understanding that a higher rate of change indicates more hours of sleep per night.

• However, the explanation is incomplete, and the rates per night are not provided or explained.

This response contains the correct solution but the required work is limited.

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Time (hours)

Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

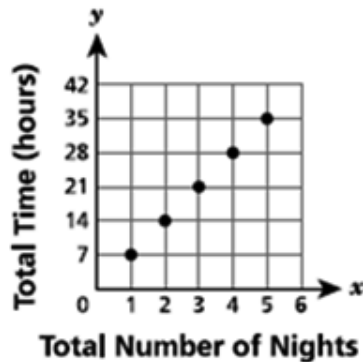*Explain how you determined your answer.*

they both sleep 9 hrs at night

Score Credit 0 (out of 3 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

• No claim is made as to who gets more sleep per night, and the explanation provided is incorrect.

Holistically, this response shows no overall understanding of the task.

48

Kaley and Mark each tracked their total amount of sleep, to the nearest hour, for a science project and determined that their total hours of sleep is proportional to the total number of nights. The graph and the table shown below represent the sleep times for Kaley and Mark.

KALEY'S SLEEP TIME

Total Number of Nights

MARK'S SLEEP TIME

Total Number of Nights	Total Time (hours)
2	18
3	27
4	36
5	45

Based on the graph and the table, determine who gets more sleep per night.

Explain how you determined your answer.

mark gets more sleep because you can just read how much sleep he gets

---

Score Credit 0 (out of 3 credits)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
- Mark is correctly identified as getting more hours of sleep per night.
- However, although the work contains some correct elements, the explanation provided is insufficient to demonstrate any understanding of the task.

Holistically the work is not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

Grade 8

Mathematics

Scoring Leader Materials
2025 Training Set