Mathematics Assessment
Quick Guide

End-of-Course Exams
Year 1

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8 Study the pattern shown in the table.

What is the value of *s* when *r* equals 10?

r	0	2	4	6	8	
s	7	11	23	43	71	

Support your answer using words, numbers, and/or diagrams.

What is the value of *s* when *r* equals 10? _____

Scoring Rubric

High School Mathematics WASL Practice Test Item 8	
Strand: Algebraic Sense	
AS01	Learning Target: (Patterns and Functions) Recognize, extend or create a pattern or sequence of pairs of numbers representing a linear function; identify or write a rule to describe a pattern, sequence, and/or a linear function (1.5.1, 1.5.2)

A **2-point response** shows clear understanding of how to determine and extend the pattern. The student clearly indicates that the value of s would equal 107 and provides a reasonable explanation and/or supporting work to justify this answer.

For example, the student may

- Show or explain that $s = r^2 + 7$.
- Shows first differences are 4, 12, 20, 28, and the next difference should be 36.

A **1-point response** shows some understanding of how to determine and extend the pattern.

For example, the student may do one of the following:

- Indicate that the value of s would equal 107, but does not provide a valid explanation to support the answer
- Indicate clear understanding of the pattern (e.g., sets up the equation $s = r^2 + 7$), but makes a computation or substitution error, so that the value obtained for $s \neq 107$.

A **0-point response** shows little or no mathematical understanding of the problem.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	0	2	4	6	8	10
s	7	11	23	43	71	107

Show your work.

$S = r^2 + 7$

What is the value of s when r equals 10? 107

Score:

2

Annotation:

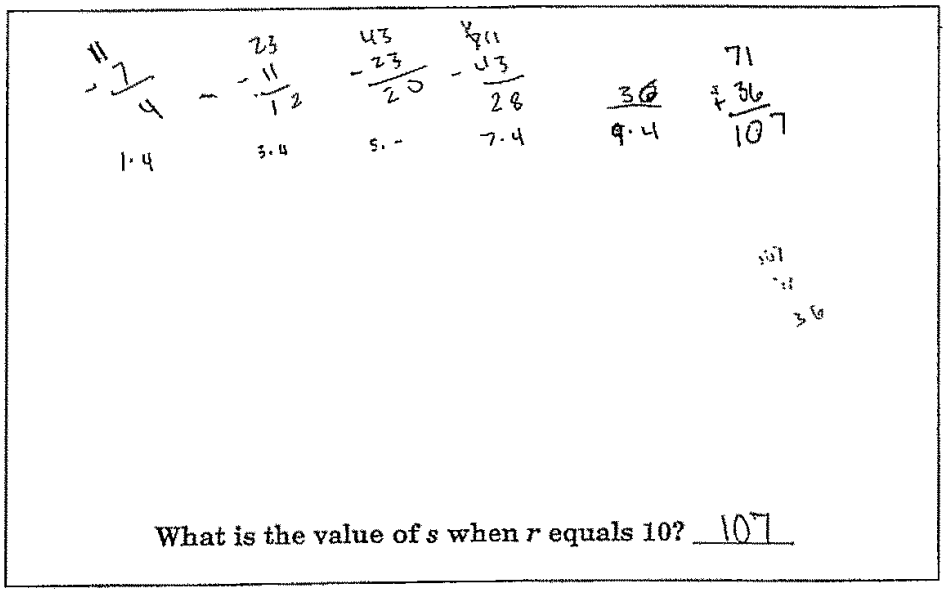
The student shows understanding of how to determine and extend the pattern, indicates the value of s equals 107, and justifies the answer by providing the appropriate algebraic equation. This response earns two points.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	0	2	4	6	8	10
s	7	11	23	43	71	107

Show your work.



Score:

2

Annotation:

The student shows understanding of how to determine and extend the pattern, indicates the value of s equals 107, and provides supporting work to justify the answer. This response earns two points.

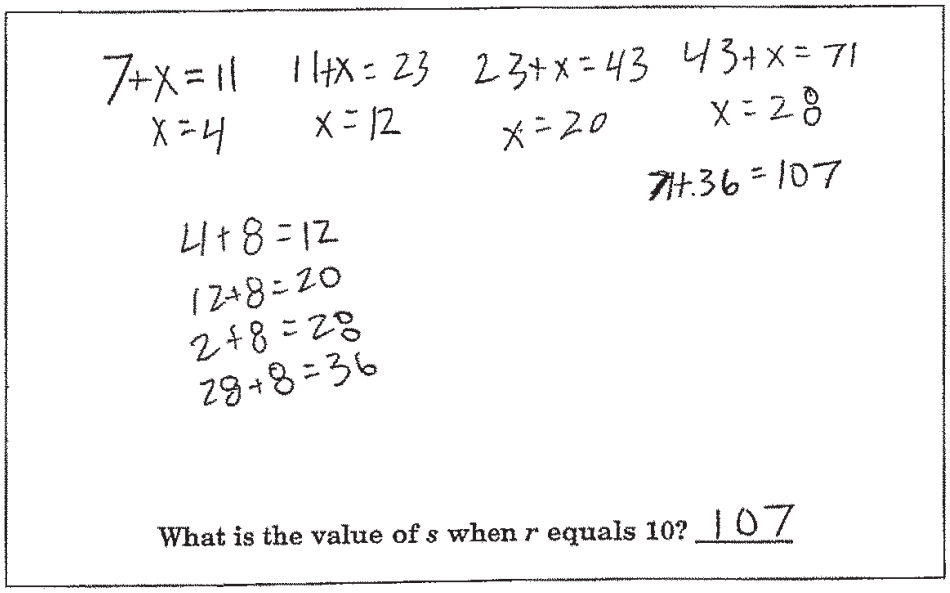
8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	0	2	4	6	8	10
s	7	11	23	43	71	107

4 12 20 25 36

Show your work.



Score:

2

Annotation:

The student shows understanding of how to determine and extend the pattern, indicates the value of s equals 107, and provides supporting work to justify the answer. This response earns two points.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	0	2	4	6	8	
s	7	11	23	43	71	

Show your work.

What is the value of s when r equals 10? 107

Score:

1

Annotation:

The student shows partial understanding of how to determine and extend the pattern by indicating that the value of s equals 107 but provides no supporting work. This response earns one point.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

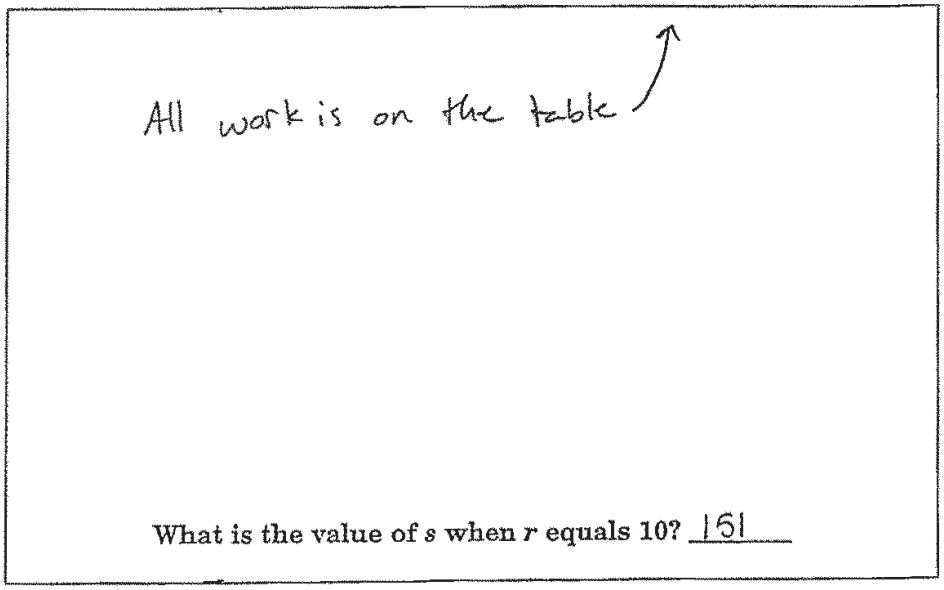
r	0	2	4	6	8	9	10
s	7	11	23	43	71	107	151

+2 +2 +2 +2 +2 +2

+4 +12 +20 +28 +36 +44

+8 +8 +8 +8 +8

Show your work.



Score:
1

Annotation:

The student shows partial understanding of how to determine and extend the pattern. Gives supporting work that has a computation error that extends the pattern to 151. This response earns one point.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	0	2	4	6	8	10
s	7	11	23	43	71	107

Show your work.

What is the value of s when r equals 10? 107

Score:

1

Annotation:

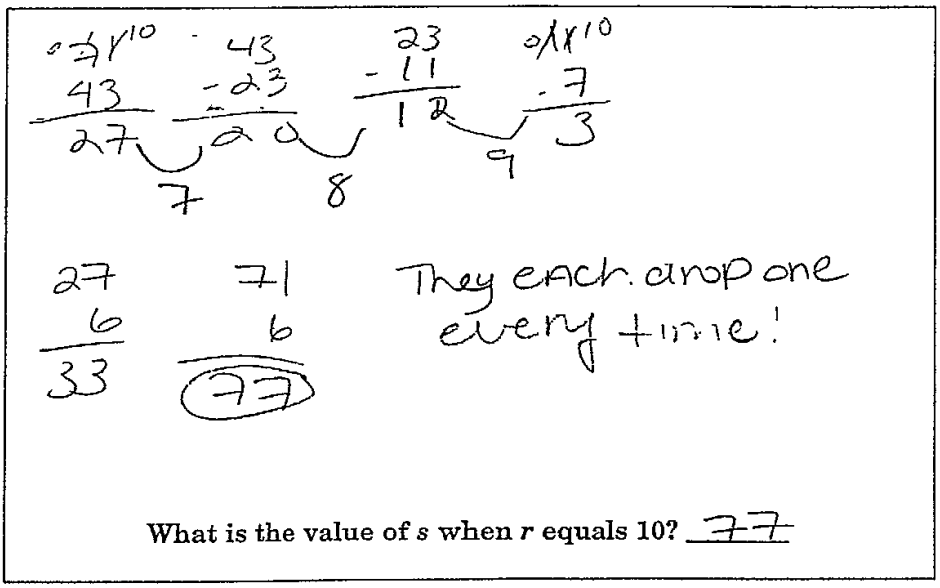
The student shows partial understanding of how to determine and extend the pattern by indicating that the value of s equals 107 but provides no supporting work. This response earns one point.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	0	2	4	6	8	10
s	7	11	23	43	71	77

Show your work.



Score:

0

Annotation:

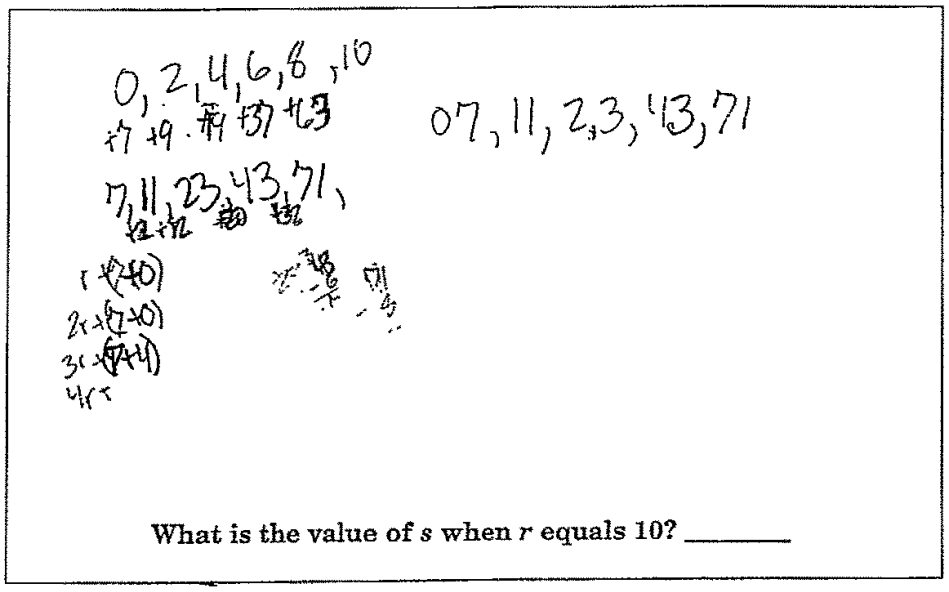
The student shows little or no understanding of how to determine and extend a pattern by incorrectly indicating that s equals 77 and giving inappropriate supporting work. This response earns zero points.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	r	0	2	4	6	8	
s	s	7	11	23	43	71	

Show your work.



Score:

0

Annotation:

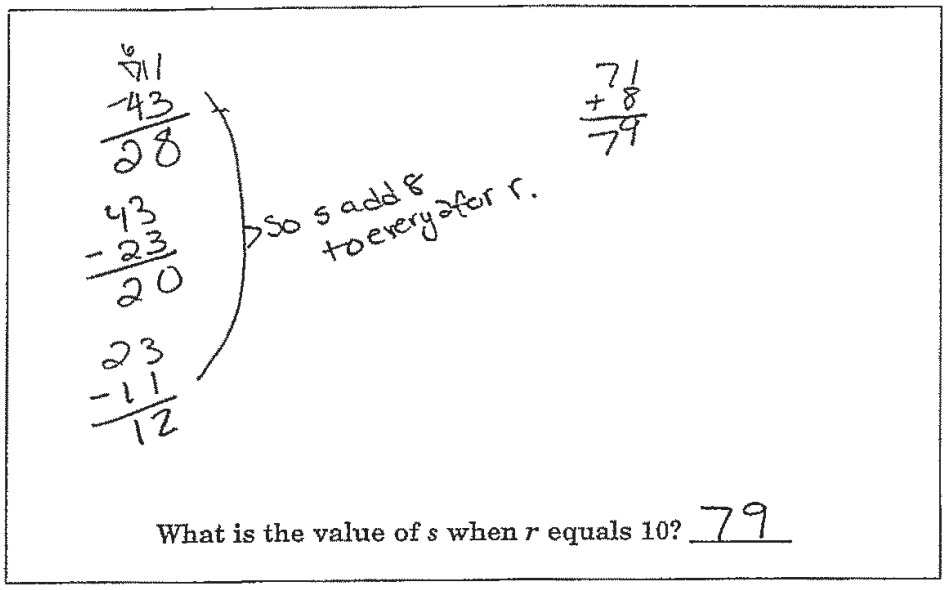
The student shows little or no understanding of how to determine and extend a pattern by giving inappropriate work and not indicating a value for s. This response earns zero points.

8. Study the pattern shown in the table.

What is the value of s when r equals 10?

r	0	2	4	6	8	10
s	7	11	23	43	71	79

Show your work.



Score:

0

Annotation:

The student shows little or no understanding of how to determine and extend a pattern by incorrectly indicating that s equals 79 and giving inappropriate supporting work. This response earns zero points.

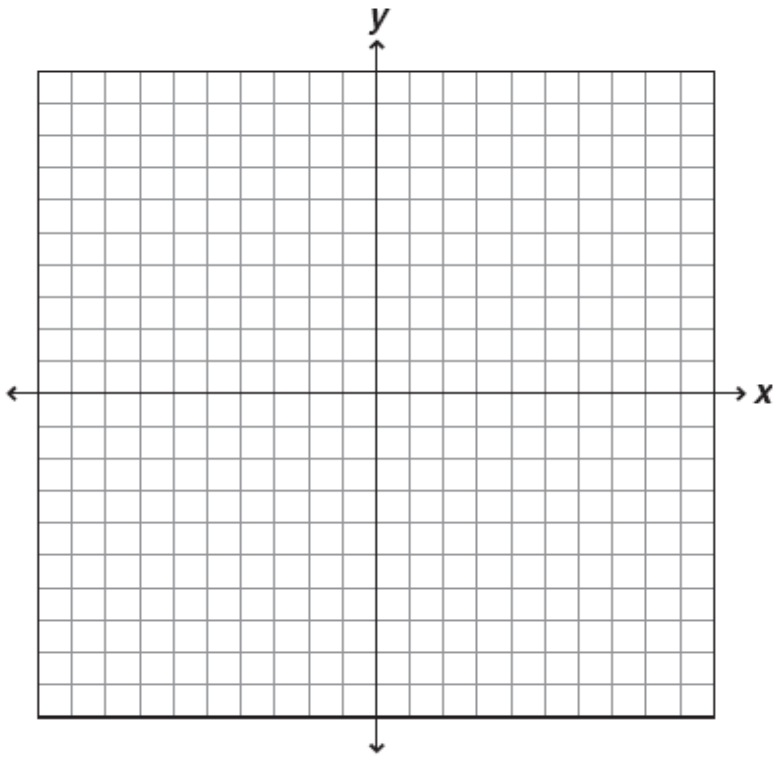
10 The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a line graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other.

Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Scoring Rubric

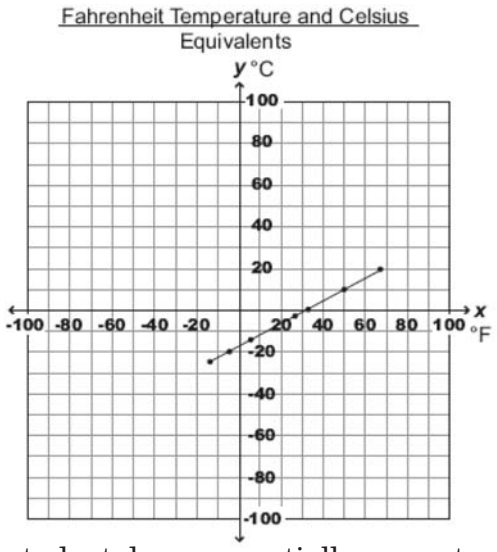
High School Mathematics WASL Practice Test Item 10	
Strand: Communicates Understanding	
CU02	Learning Target: (Organize, Represent, and Share Information) Organize, clarify, and refine mathematical information for a given purpose; use everyday and mathematical language and notation in appropriate and efficient forms to clearly express or represent complex ideas and information; explain and/or represent complex mathematical ideas and information in ways appropriate for audience and purpose in a context that is relevant to tenth grade students (4.2.1, 4.2.2, 4.2.3)

A **2-point response:** The student clearly represents the given information in a graph by including:

- two consistent and two appropriate scales
- labels on both axes
- an informative title that tells who and what the graph is about
- accurately plotted points

Allow for one error which may include the following: a missing title, a missing label, and inconsistent scale or an incorrectly plotted point

Example:



A **1-point response:** The student draws a partially accurate graph of the relationship between Celsius and Fahrenheit. The graph has two or three errors.

NOTE: Two missing labels are considered two errors.

NOTE: Signs switched on axis scale are considered an error (i.e., negative on right side of x-axis and positive on left side of x-axis).

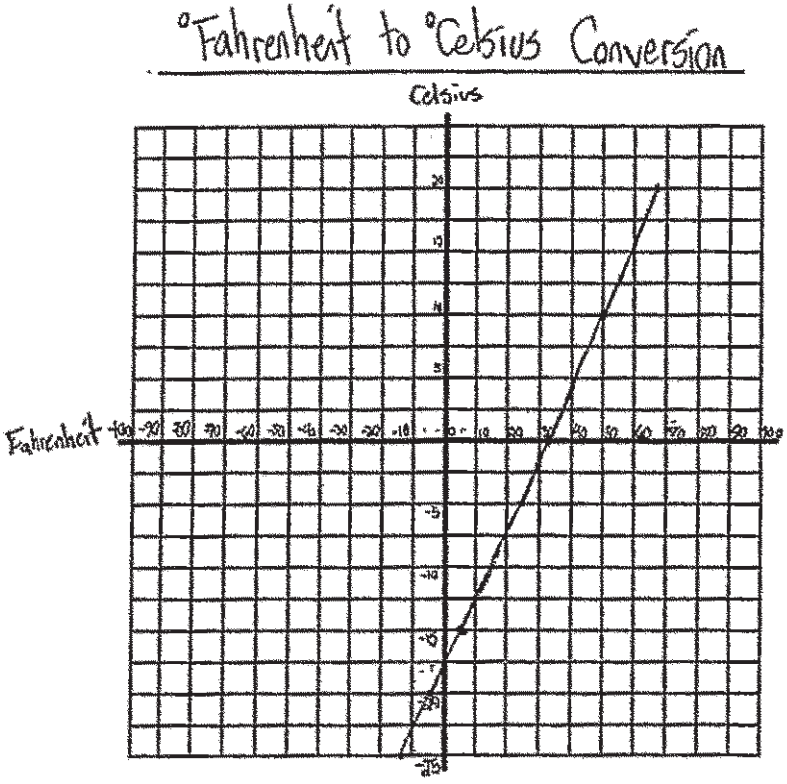
A **0-point response:** The student shows little or no mathematical understanding of representing information in a graph. For example, it has four or more errors or plots the data points as the scale.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

2

Annotation:

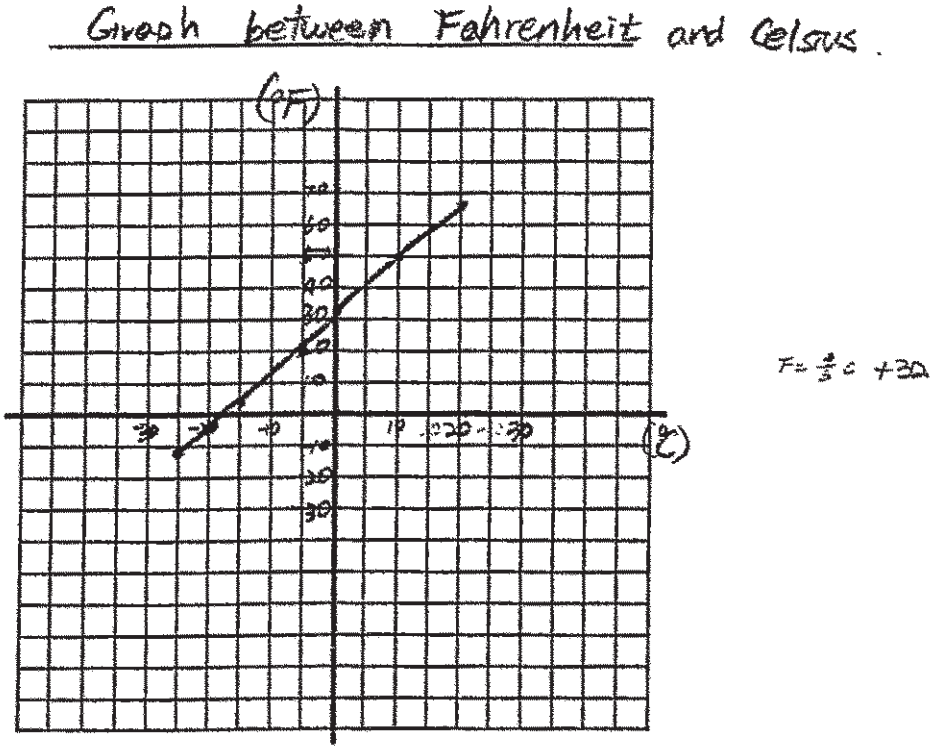
The student shows understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The response includes correctly plotted points, two consistent and appropriate scales, an appropriate title and appropriate labels on both axes. This response earns two points.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

2

Annotation:

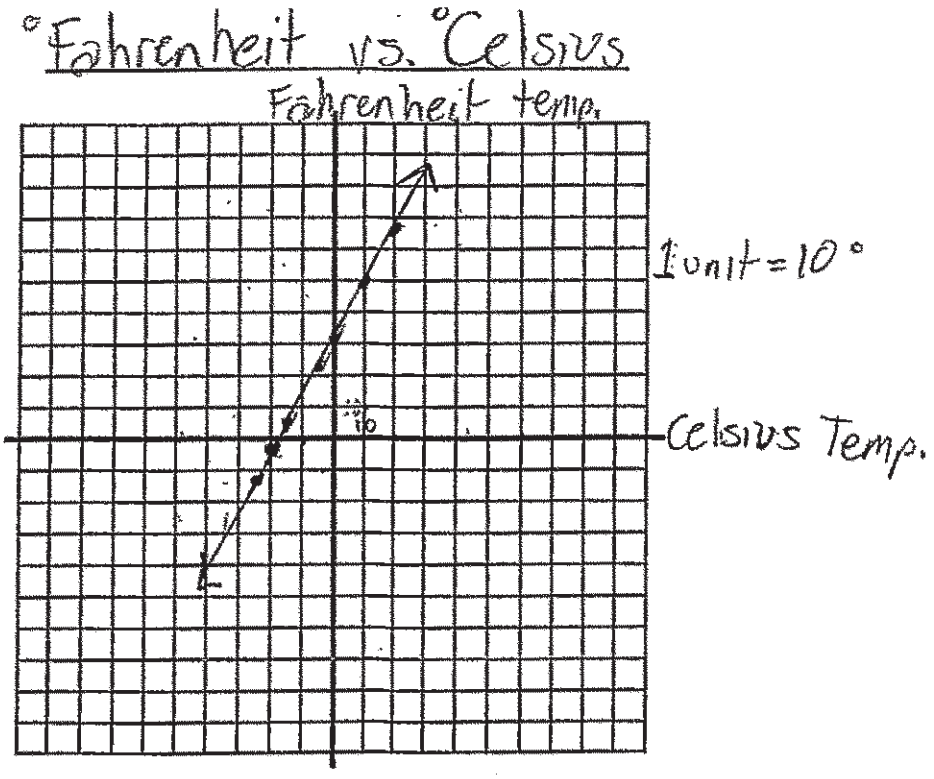
The student shows understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The response includes correctly plotted points, two consistent and appropriate scales, an appropriate title and appropriate labels on both axes. This response earns two points.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

2

Annotation:

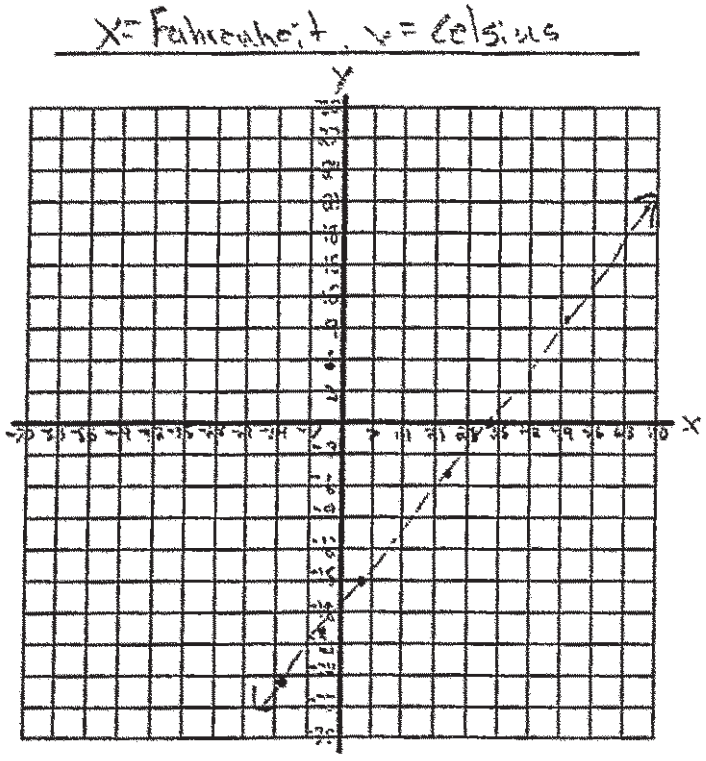
The student shows understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The response includes correctly plotted points, two consistent and appropriate scales, an appropriate title and appropriate labels on both axes. This response earns two points.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

2

Annotation:

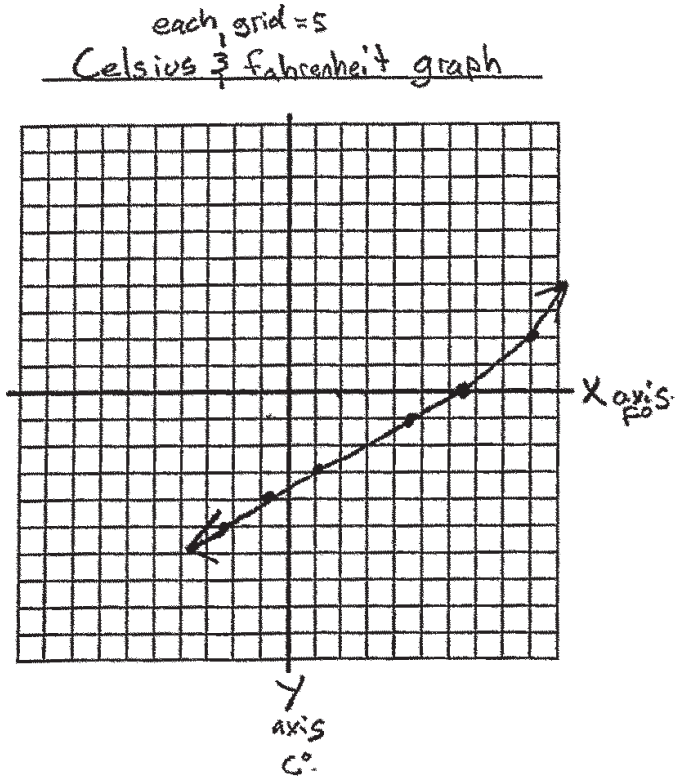
The student shows understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The response includes correctly plotted points, two consistent and appropriate scales, and appropriate labels on both axes. The response has an inappropriate title. This response earns two points.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

1

Annotation:

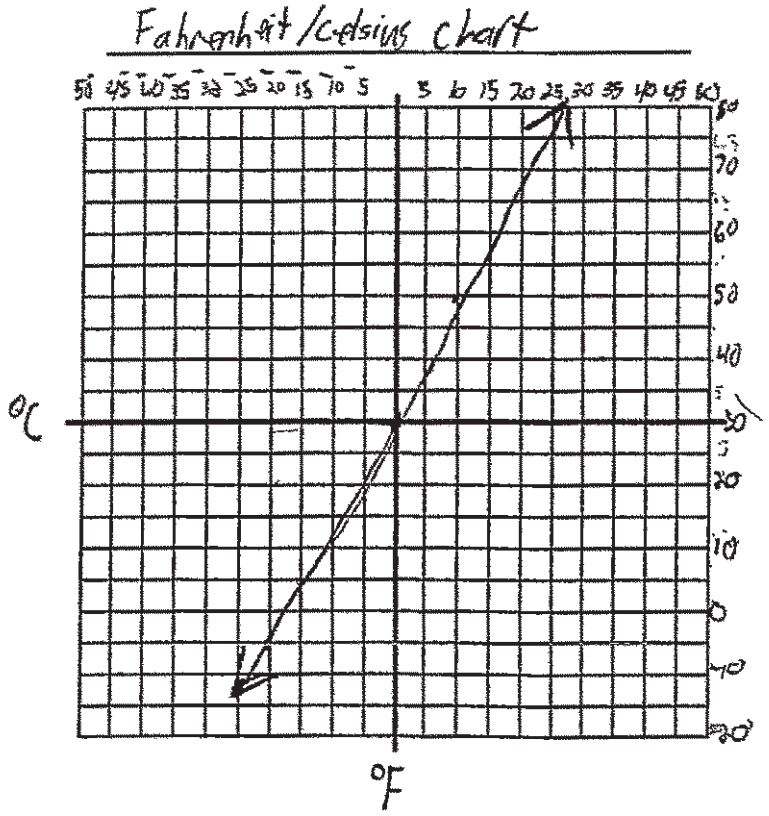
The student shows partial understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The response includes two consistent but inappropriate scales, an appropriate title, and appropriate labels on both axes. Two points are misplotted (68, 20) and (50, 10), which is two errors. The response earns one point.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scale for the axes
- Accurate labels for the axes



Score:

1

Annotation:

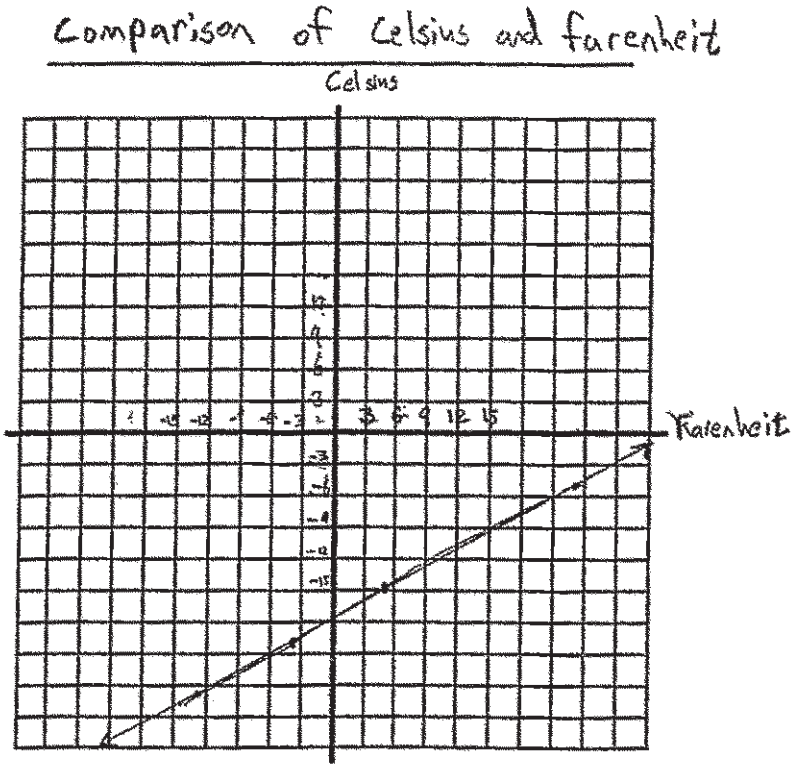
The student shows partial understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The response includes two consistent scales, with appropriate labels on both axes. Two points are misplotted (-5, 23) and (0, 32), and there is an incomplete title. This response earns one point.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scale for the axes
- Accurate labels for the axes



Score:

1

Annotation:

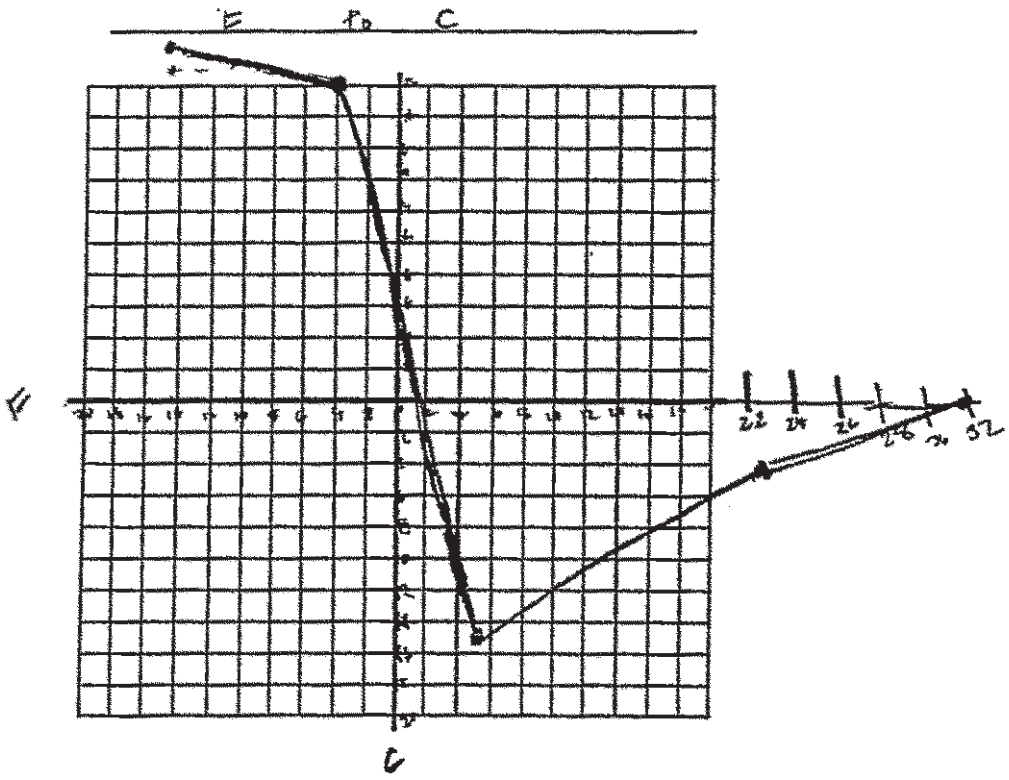
The student shows partial understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The response includes two consistent but inappropriate scales, an appropriate title, and appropriate labels on both axes. An inappropriate scale caused three points to be omitted: (32, 0), (50, 10), and (68, 20). This response earns one point.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

0

Annotation:

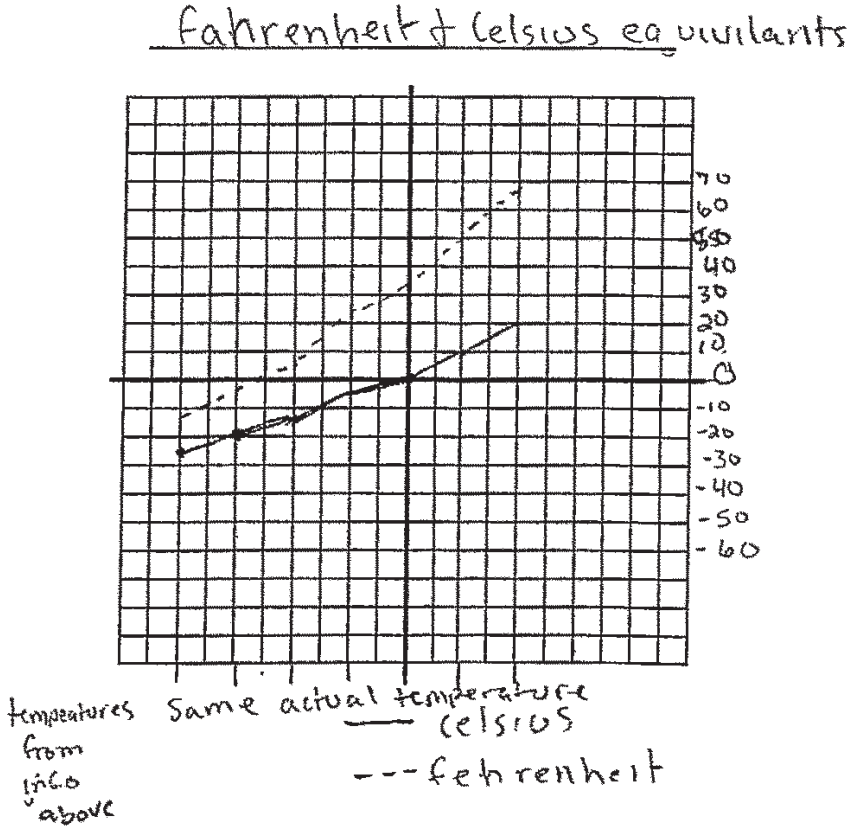
The student shows little or no understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The graph includes two consistent but inappropriate scales, an incomplete title, and appropriate labels on both axes. Two points are misplotted (-13, -25) and (-4, -20) due to an inappropriate scale plus (50, 10) and (68, 20) are missing. This response errors earns zero points.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

° Fahrenheit	° Celsius
–13	–25
–4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

0

Annotation:

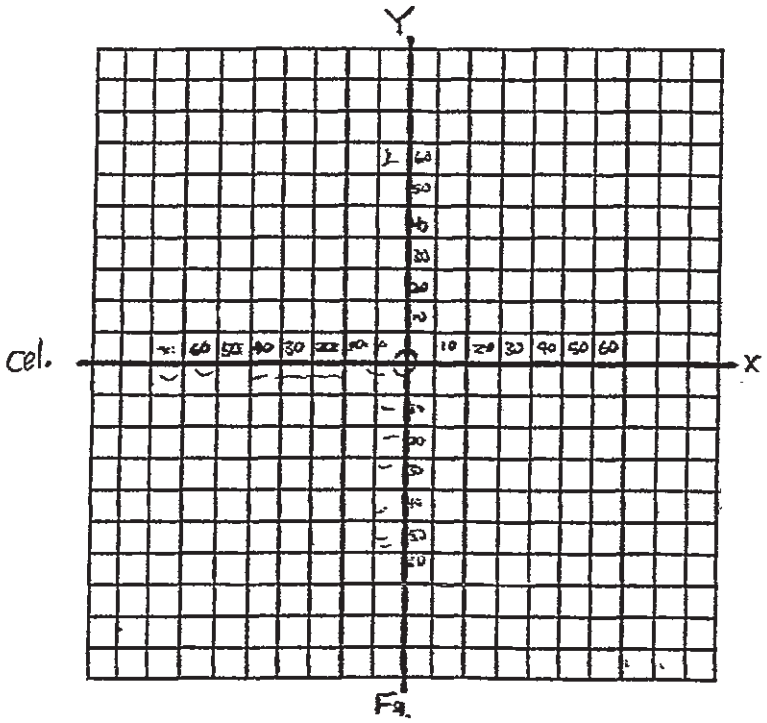
The student shows little or no understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The graph shows two lines, one for Celsius and one for Fahrenheit. This response earns zero points.

10. The table shows the relationship between some Fahrenheit temperatures and their Celsius equivalents.

°Fahrenheit	°Celsius
-13	–25
-4	–20
5	–15
23	–5
32	0
50	10
68	20

Use this information to make a graph that shows Fahrenheit temperature on one axis and Celsius temperature on the other. Be sure to include:

- An informative title that tells who and what the graph is about
- Appropriate scales for the axes
- Accurate labels for the axes



Score:

0

Annotation:

The student shows little or no understanding of how to effectively and appropriately organize and represent mathematical information in a graph. The graph includes two consistent and appropriate scales and labels on both axes. However, no title is given and no points are plotted. This response earns zero points.

12 Kesha is planning to rent a van for her trip to Mt. Rainier. Two of her friends each rented the same type of van from the same car rental company last week. This is what they told her:

> John: "The cost of my rental was $240. The company charged me a certain amount per day and a certain amount per mile. I had the rental for five days and I drove it 200 miles."
>
> Katie: "The cost of my rental was only $100. I drove it for 100 miles and had it for two days."

Kesha plans to get the same type of van that John and Katie had from the same car rental company. Kesha estimated her trip would be 250 miles, and she would have the vehicle for four days.

Let *C* = cost, *M* = miles, and *D* = days

Which of the following equations could Kesha use to figure out how much her rental would cost?

○ A. $C = 40.00M + 0.20D$

○ B. $C = 40.00D + 0.20M$

○ C. $C = 20.00M + 0.40D$

○ D. $C = 20.00D + 0.40M$

Key: B

25 Which term is a factor of $3a^2 + 12a$?

- ○ **A.** $3a$
- ○ **B.** $4a$
- ○ **C.** $3a^2$
- ○ **D.** $4a^2$

Key: A

27 The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
Option 2: 5¢ a can plus $5.00 an hour
Option 3: 40¢ a can and no hourly wage

Jamal wrote an equation for each salary option to see what he could make per hour.

Option 1: $y = 0.25x + 1.00$
Option 2: $y = 0.05x + 5.00$
Option 3: $y = 0.40x$

Jamal estimates that he can recycle a minimum of 20 cans per hour.

Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers, and/or diagrams.

Which option allows Jamal to make the most money? _____

Scoring Rubric

High School Mathematics WASL Practice Test Item 27	
Strand: Algebraic Sense	
AS03	Learning Target: (Evaluating and Solving) Simplify expressions; solve multi-step equations, systems of equations, and one-step inequalities. (1.5.5, 1.5.6)

A **2-point response**: The student shows understanding of solving multi-step equations in a context by doing one of the following:

- selects Option 3 and shows supporting work. Allow for one error.
- selects Option 1, Option 2, or all three as a direct result of one computation or notation error in the supporting work.

Example:
Option 1: 0.25 (20) + 1.00 = $6.00
Option 2: 0.05 (20) + 5.00 = $6.00
Option 3: 0.40 (20) = $8.00
Option 3 will allow Jamal to make the most money.

A **1-point response**: The student does one of the following:

- selects Option 3, but supporting work is incomplete or flawed
- fails to select Option 3, but shows correct computations or total amounts for all three options
- selects Option 1 or Option 2 as a direct result of two computation and/or notation errors in the supporting work
- selects no option and has one computation error.

A **0-point response**: The student shows very little or no understanding of evaluating expressions in a context.

NOTE: Work must show substitution or show the 20 cans in the computation.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
Option 2: 5¢ a can plus $5.00 an hour
Option 3: 40¢ a can and no hourly wage

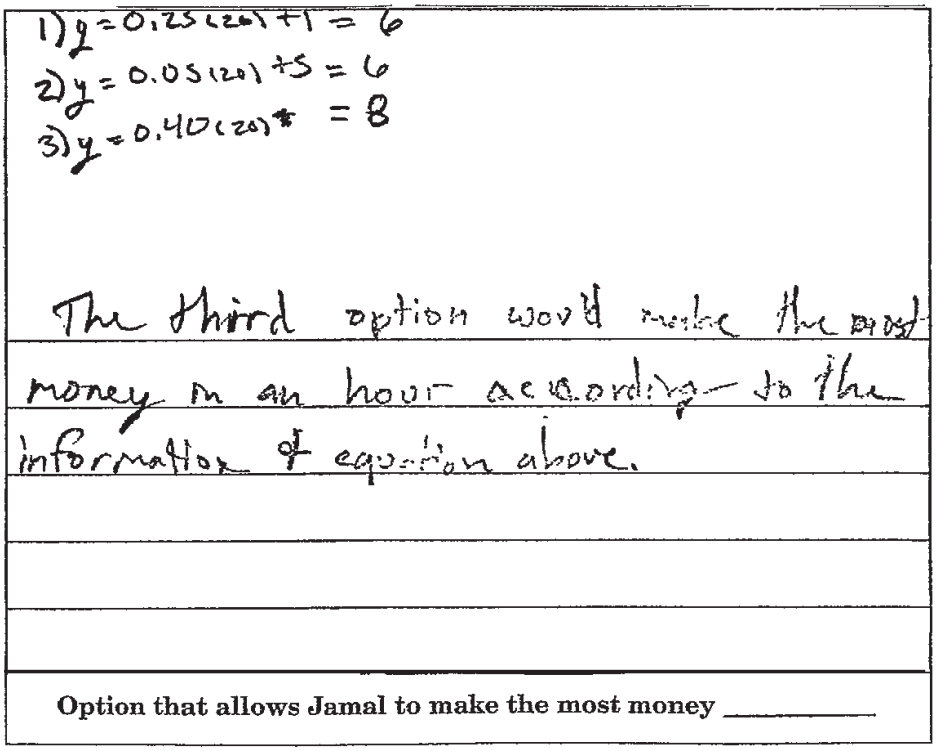
Jamal wrote an equation for each salary option to see what he could make per hour.

Option 1: $y = 0.25x + 1.00$
Option 2: $y = 0.05x + 5.00$
Option 3: $y = 0.40x$

Jamal estimates that he can recycle a minimum of 20 cans per hour.

Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers, and/or diagrams.



Score:

2

Annotation:

The student shows understanding of solving multi-step equations in a context by selecting Option 3 and showing supporting work by substituting 20 for x into each equation and correctly solving for y. This response earns two points.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
Option 2: 5¢ a can plus $5.00 an hour
Option 3: 40¢ a can and no hourly wage

Jamal wrote an equation for each salary option to see what he could make per hour.

Option 1: $y = 0.25x + 1.00$
Option 2: $y = 0.05x + 5.00$
Option 3: $y = 0.40x$

Jamal estimates that he can recycle a minimum of 20 cans per hour.

Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers, and/or diagrams.

Option 3 is the best if you can recyle 20 cans per hour .40¢ per can would equal out to $8.00 per hour.

Option that allows Jamal to make the most money _____

Score:
2

Annotation:

The student shows understanding of solving multi-step equations in a context by selecting Option 3 and showing supporting work for Options 1 and 3 and the correct solution for Option 2. This response earns two points.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
Option 2: 5¢ a can plus $5.00 an hour
Option 3: 40¢ a can and no hourly wage

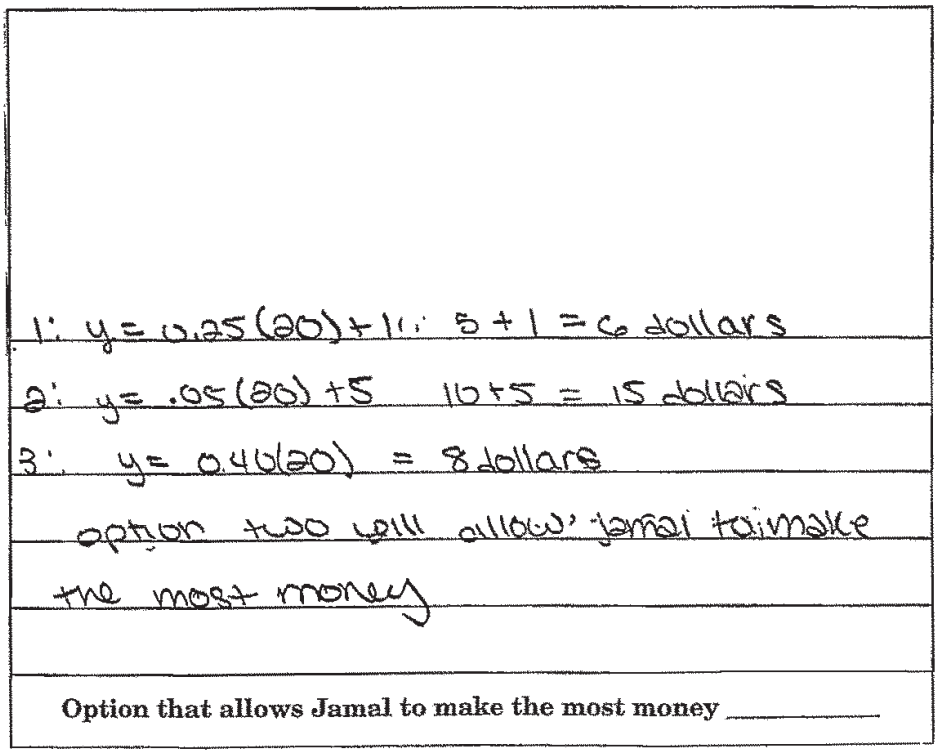
Jamal wrote an equation for each salary option to see what he could make per hour.

Option 1: $y = 0.25x + 1.00$
Option 2: $y = 0.05x + 5.00$
Option 3: $y = 0.40x$

Jamal estimates that he can recycle a minimum of 20 cans per hour.

Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers, and/or diagrams.



Score:

2

Annotation:

The student shows understanding of solving multi-step equations in a context by selecting Option 2 which is the correct answer for this response due to one computation error in the supporting work. Option 2 has a solution of $15 rather than $6. This response earns two points.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
Option 2: 5¢ a can plus $5.00 an hour
Option 3: 40¢ a can and no hourly wage

Jamal wrote an equation for each salary option to see what he could make per hour.

Option 1: $y = 0.25x + 1.00$
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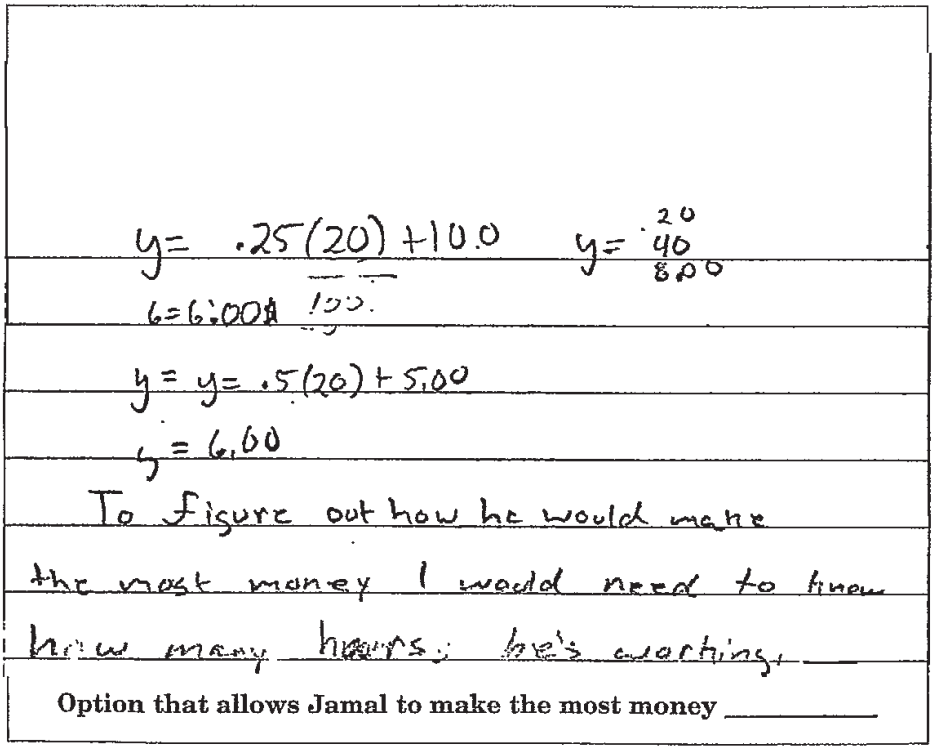
Show your work to support your answer using words, numbers, and/or diagrams.



Score:
1

Annotation:

The student shows partial understanding of solving multi-step equations in a context by showing correct computations for all three options, but failing to select Option 3. This response earns one point.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
Option 2: 5¢ a can plus $5.00 an hour
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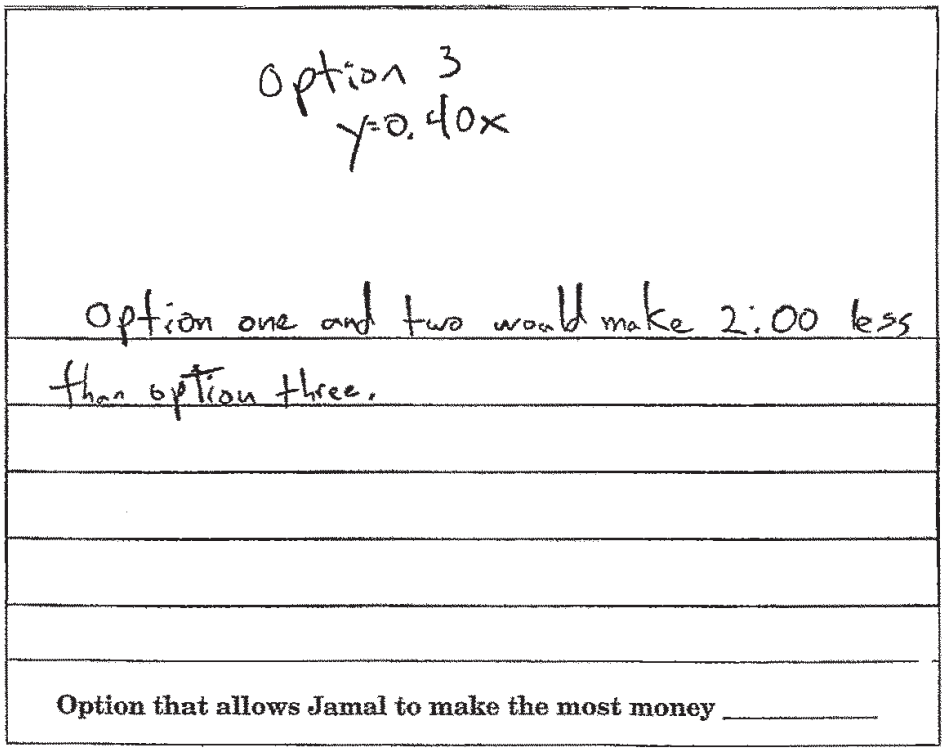
Jamal estimates that he can recycle a minimum of 20 cans per hour.

Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers, and/or diagrams.



Score:

1

Annotation:

The student shows partial understanding of solving multi-step equations in a context by selecting Option 3, but supporting work is not shown. This response earns one point.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
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Jamal wrote an equation for each salary option to see what he could make per hour.

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Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

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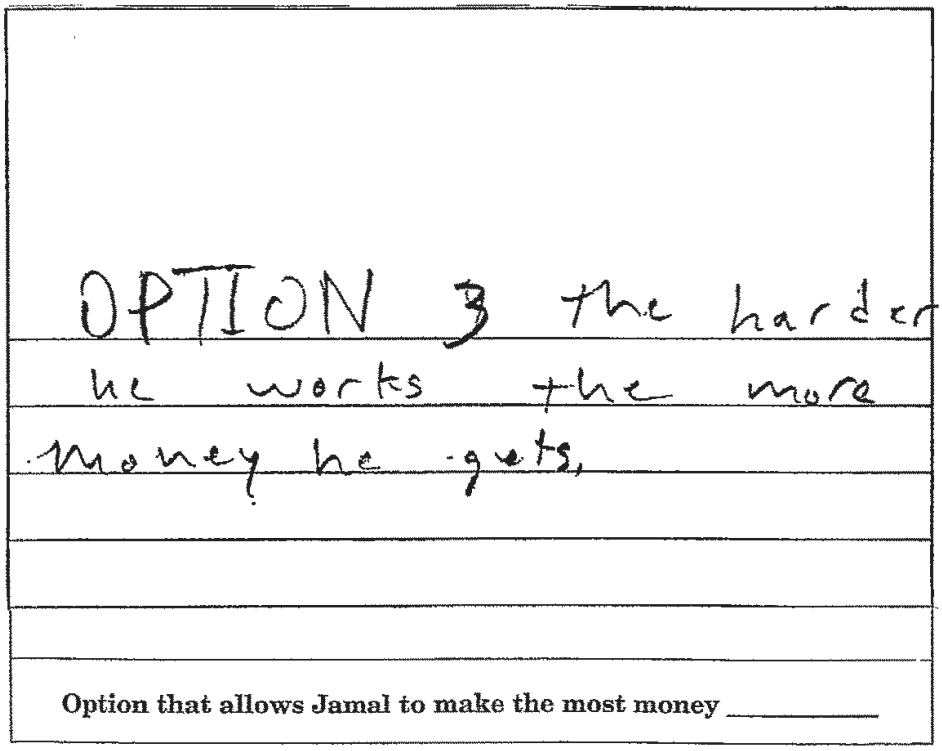

Score:

1

Annotation:

The student shows partial understanding of solving multi-step equations in a context by selecting Option 3, but supporting work is not shown. This response earns one point.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
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Option 1: $y = 0.25x + 1.00$
Option 2: $y = 0.05x + 5.00$
Option 3: $y = 0.40x$

Jamal estimates that he can recycle a minimum of 20 cans per hour.

Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers and/or numbers.

For 1 day 8 hrs. 60 cans an hour

1- $y = .25(60) + 1.00(8)$
$y = \$15 + \$8$ $y = \$23$

2- $y = .05(60) + 5.00(8)$
$y = \$3 + \$40$ $y = \$43$

3- $y = .40(60)$ $y = \$24$

Option 2 is the best because even if you dont recycle any cans you get at least 40$ for an 8 hour day.

Option that allows Jamal to make the most money _____

Score:

0

Annotation:

The student shows little or no understanding of solving multi-step equations in a context by selecting Option 2 due to incorrect calculations. Calculations attempt to determine a daily rate by multiplying each hourly rate by 8, but 60 is substituted for x, number of cans, which implies only 3 hours per day. This response earns zero points.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
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Option 1: $y = 0.25x + 1.00$
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Option 3: $y = 0.40x$

Jamal estimates that he can recycle a minimum of 20 cans per hour.

Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers, and/or diagrams.

5¢ can + 5.00 an hour would make him more money because the wage is higher and the cost of a can is 5¢

Option that allows Jamal to make the most money _____

Score:

0

Annotation:

The student shows little or no understanding of solving multi-step equations in a context by selecting Option 2, not showing any supporting work, and giving a flawed explanation. This response earns zero points.

27. The Acme Recycling Company has three salary options for its part-time summer employees. The total money earned is related to the amount of cans recycled and an optional hourly wage.

Option 1: 25¢ a can plus $1.00 an hour
Option 2: 5¢ a can plus $5.00 an hour
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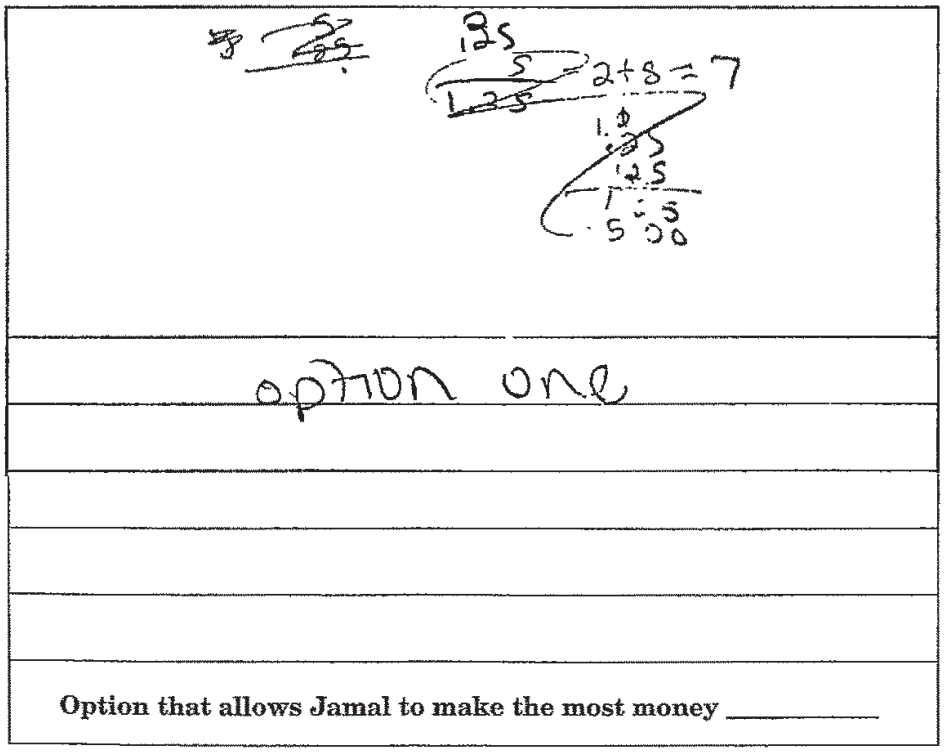
Based on these equations and Jamal's estimate, which option will allow Jamal to make the most money?

Show your work to support your answer using words, numbers, and/or diagrams.



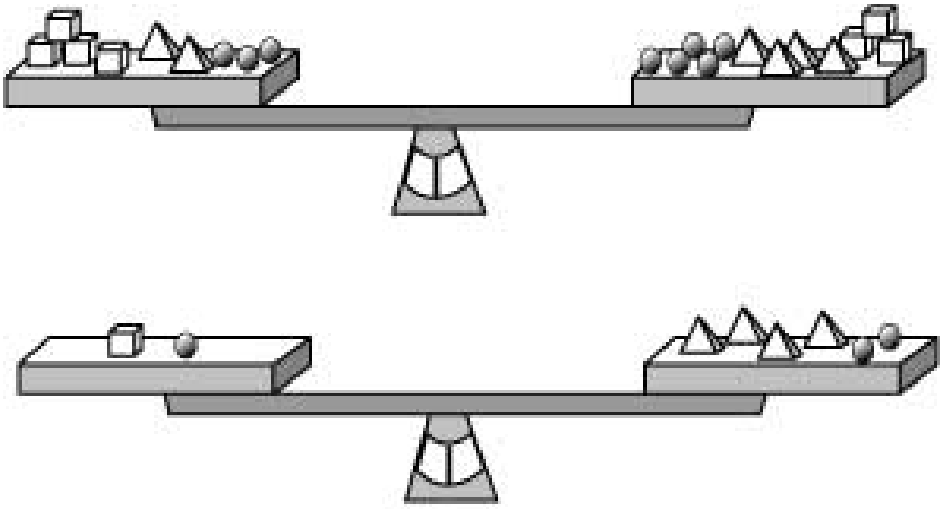
Score:

0

Annotation:

The student shows little or no understanding of solving multi-step equations in a context by selecting Option 1 and not showing any supporting work. This response earns zero points.

30 Kent is using the scale to compare the weight of various solids.

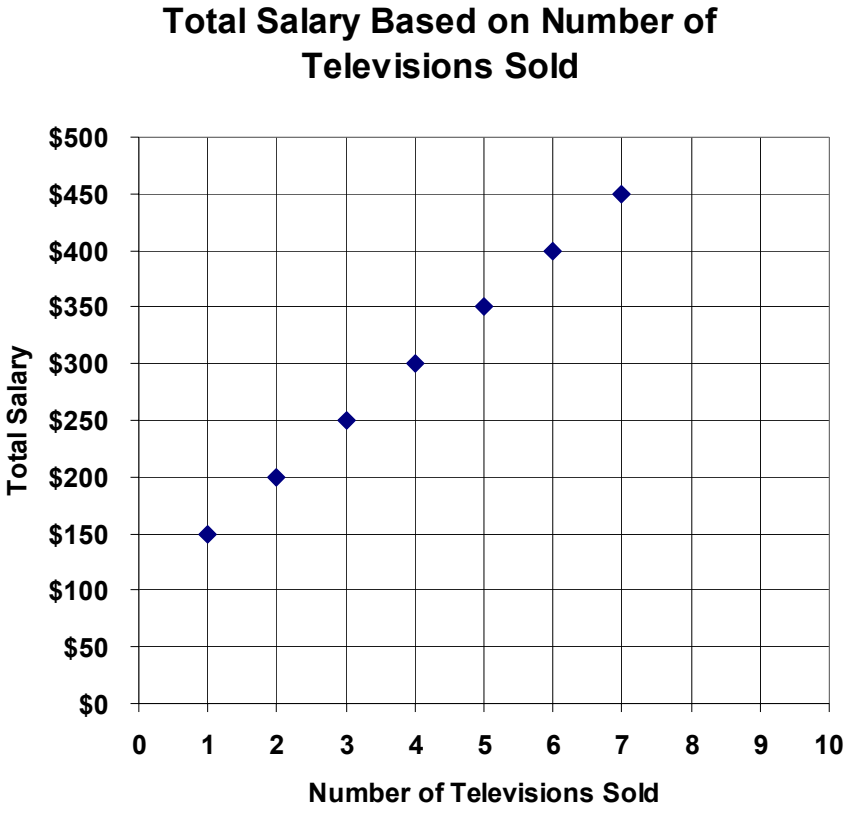


How many spheres will balance one cube?

- ○ **A.** 2 spheres
- ○ **B.** 3 spheres
- ○ **C.** 4 spheres
- ○ **D.** 5 spheres

Key: B

33 The chart shows the amount of total salary (commission plus base salary) paid to employees of a store that specializes in big screen televisions.



Which equation best represents the total salary (T) that an employee makes for selling any (n) number of television sets?

○ **A.** $T = 50n + 100$

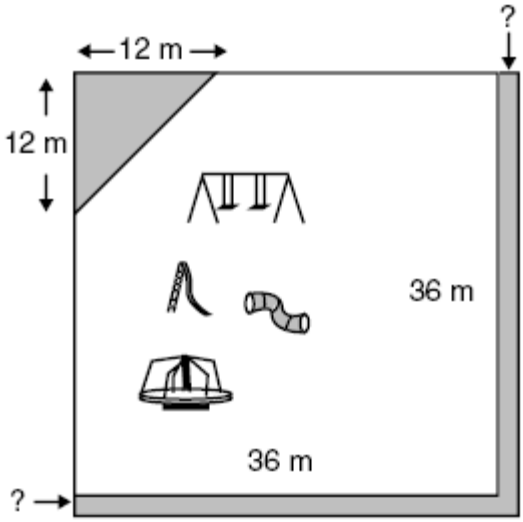
○ **B.** $T = 100(n + 50)$

○ **C.** $T = 100n + 50$

○ **D.** $T = 50(n + 100)$

Key: A

34 The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers, and/or diagrams.

Approximate width of the strip is _____

Scoring Rubric

High School Mathematics Practice Test Item 34	
Strand: Measurement	
ME03	Learning Target: (Procedures) Use formulas, including the Pythagorean Theorem, to determine measurements of triangles, prisms, or cylinders (1.2.5)

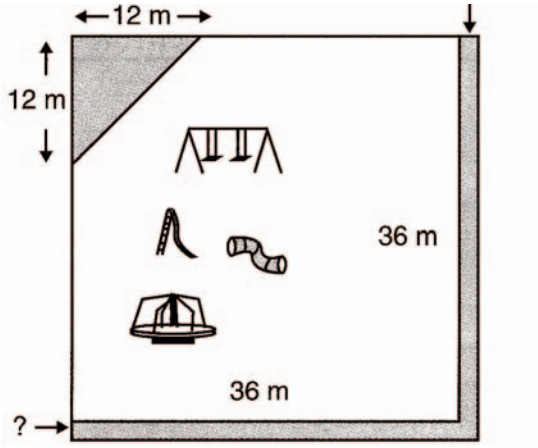
A **2-point response**: The student demonstrates an understanding of measurement by showing how to compute the area of a triangle (72 square meters) and find the width (approximately 1 meter) of two rectangles that are 36 meters long and have an area approximately equal to the area of the triangle.

A **1-point response**: The student does one of the following:

- Shows the computation of the area of the triangle (72 square meters)
- Finds the approximate dimension of the width of the rectangle, which is 1 meter
- Uses the area of a square rather than a triangle and arrives at an incorrect width of 2 meters.

A **0-point response**: The student shows no understanding of how to compute the area of a triangle or how to find the width of the rectangular piece of land with a given length and area.

34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers and/or diagrams.

$12 \times 12 = 144 \div 2 = 72$

$36 \times 2 = 72$

w of strip $\approx$ 1 m

The area they're losing is 72 m^2. The approximate length of the strip is 72 m, therefore the width only needs to be 1 m.

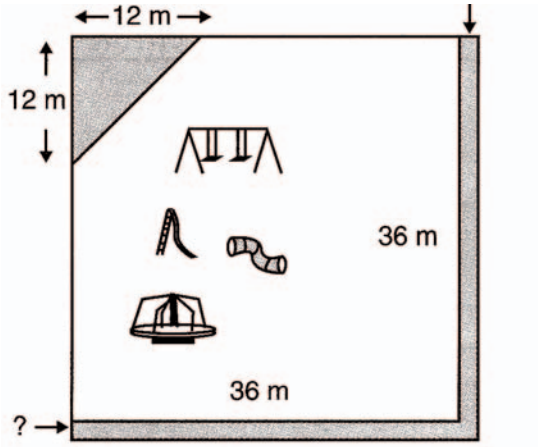
Approximate width of the strip is 1 m

Score:
2

Annotation:

The student shows understanding of determining the area of a triangle and finding the width of two rectangles whose total area is approximately the same as the triangle. The run-on equation cannot be used as support but the student recovers in the written work. The response shows a width of 1 m. This response earns two points.

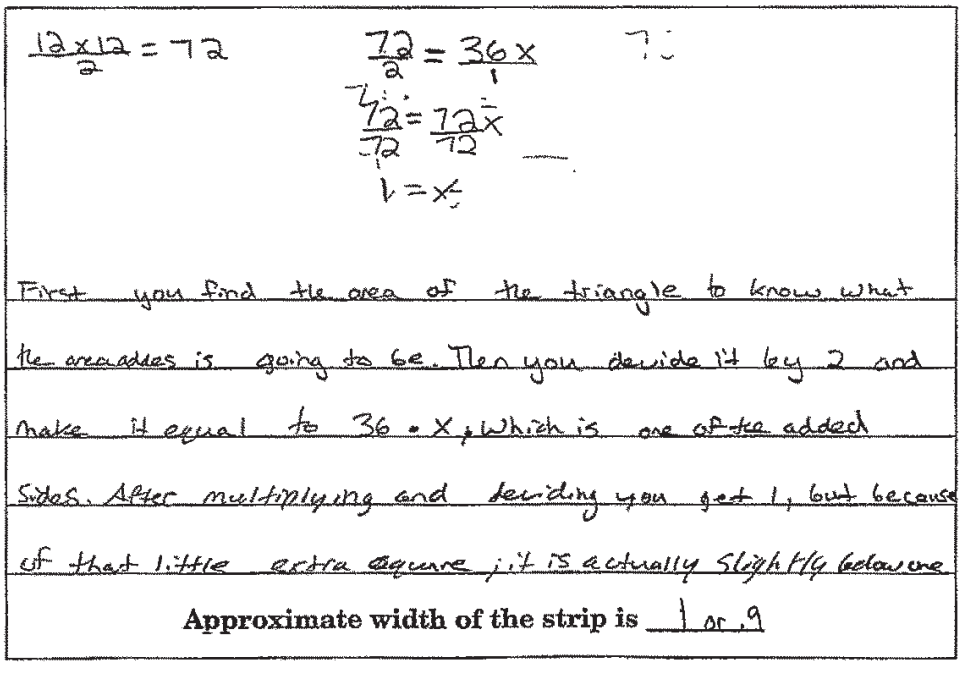
34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers and/or diagrams.

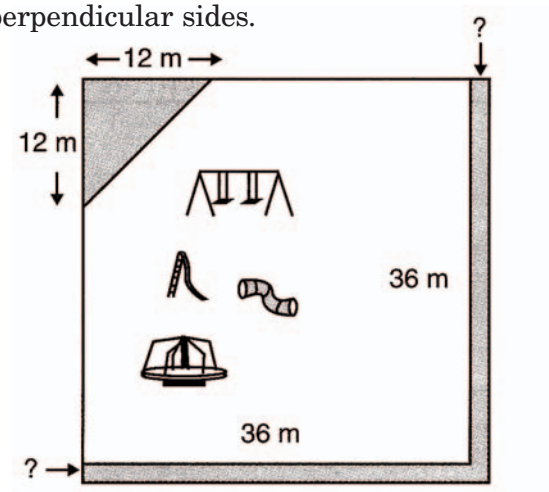


Score:
2

Annotation:

The student shows understanding of determining the area of a triangle and finding the width of two rectangles whose total area is approximately the same as the triangle. The response shows width of "*1 or .9.*" This response earns two points.

34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



$2\overline{)144}$ 72

The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers and/or diagrams.

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

$A=72m^2$

$2\overline{)72}$ 36

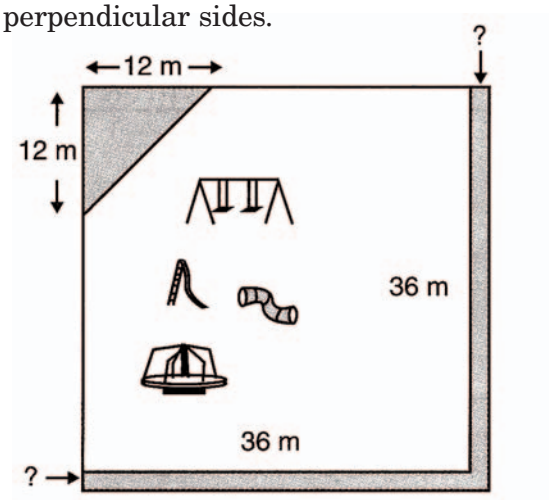
$\frac{6}{12}$

The area of the Missing Triangle is 72, divide by 2 is 36 so the width of the strip is 4

Approximate width of the strip is 4

Score:	**Annotation:**
1	The student shows partial understanding of determining the area of a triangle and finding the width of two rectangles whose total area is approximately the same as the triangle. The response shows an incorrect width of 4. This response earns one point.

34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers and/or diagrams.

Approximate width of the strip is 1 m

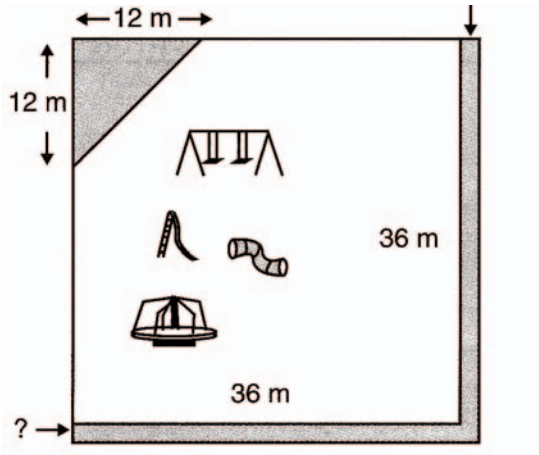
Score:

1

Annotation:

The student shows partial understanding of determining the area of a triangle and finding the width of two rectangles whose total area is approximately the same as the triangle. The response shows a correct width of 1 m but does not provide supporting work. This response earns one point.

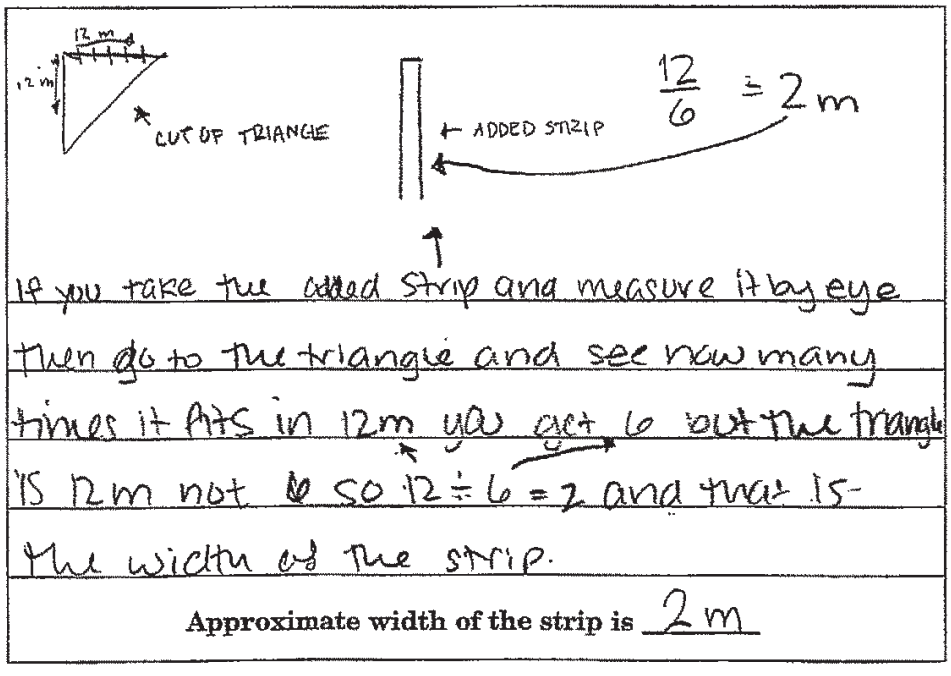
34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers, and/or diagrams.

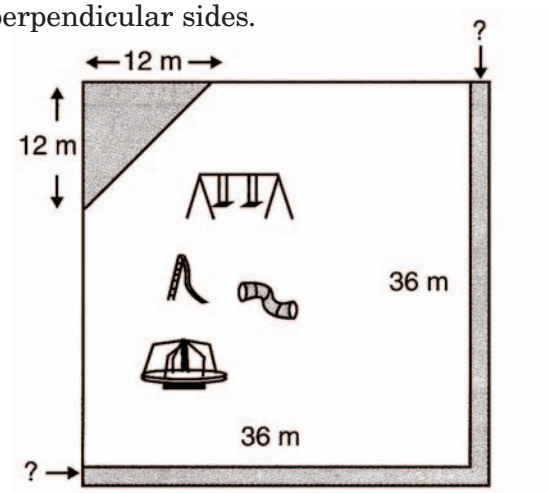


Score:
0

Annotation:

The student shows little or no understanding of determining the area of a triangle and finding the width of two rectangles whose total area approximately is the same as the triangle. The response shows an incorrect width of 2 m and no relevant supporting work. This response earns zero points.

34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers and/or diagrams.

3
12 | 36

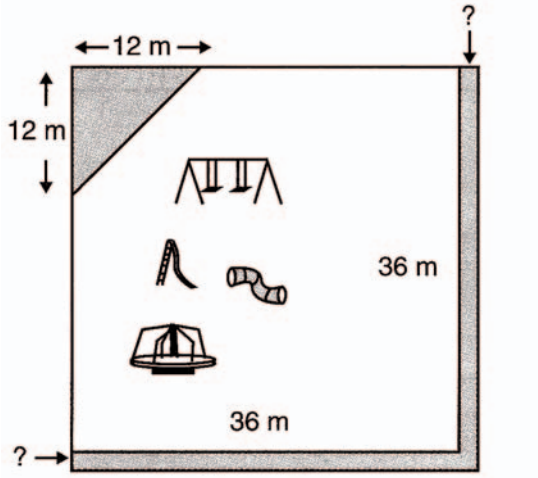
Approximate width of the strip is 3 m

Score:
0

Annotation:

The student shows little or no understanding of determining the area of a triangle and finding the width of two rectangles whose total area approximately is the same as the triangle. The response shows an incorrect width of 3 m and no relevant supporting work. This response earns zero points.

34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



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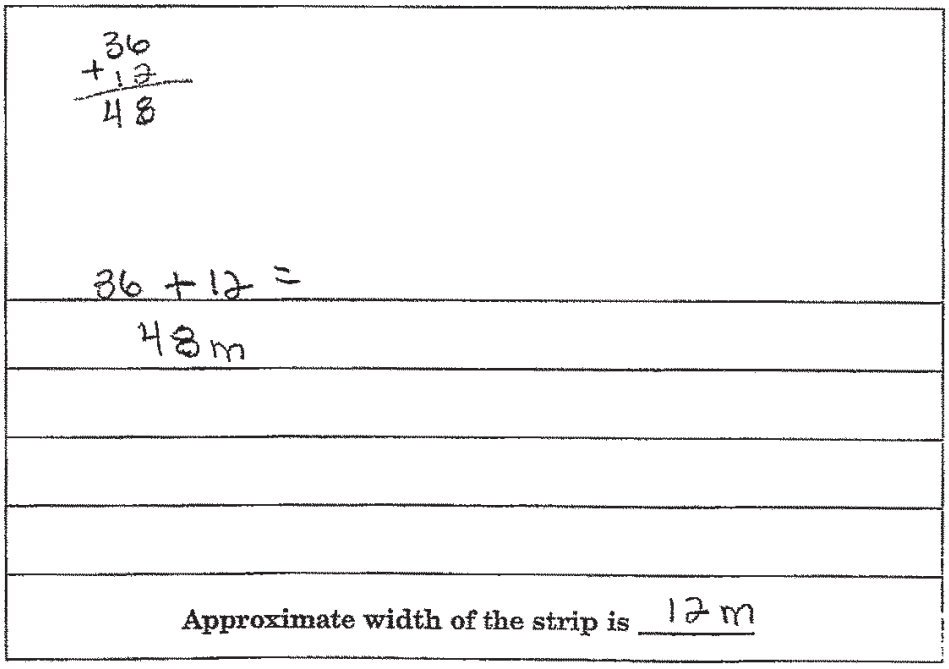
Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers and/or diagrams.

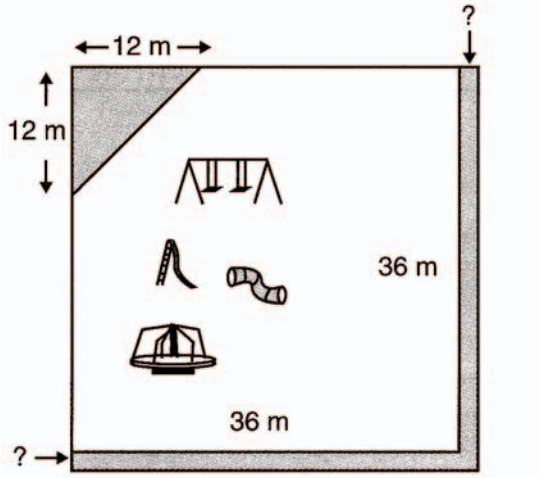


Score:
0

Annotation:

The student shows little or no understanding of determining the area of a triangle and finding the width of two rectangles whose total area approximately is the same as the triangle. The response shows an incorrect width of 3 m and no relevant supporting work. This response earns zero points.

34. The school playground, a 36 m square, is going to lose part of one corner due to construction. The city will take a triangular section that measures 12 m and 12 m on the perpendicular sides.



The city has agreed to allow the school to expand the playground on the remaining two sides to replace the lost area.

Find the approximate width of the strip that will be added to each of the two sides.

Show your work using words, numbers and/or diagrams.

36 by 36 taking off 12 by 12 will leave them with 24 by 24 you can add 6 by 6 to make it 30 by 30

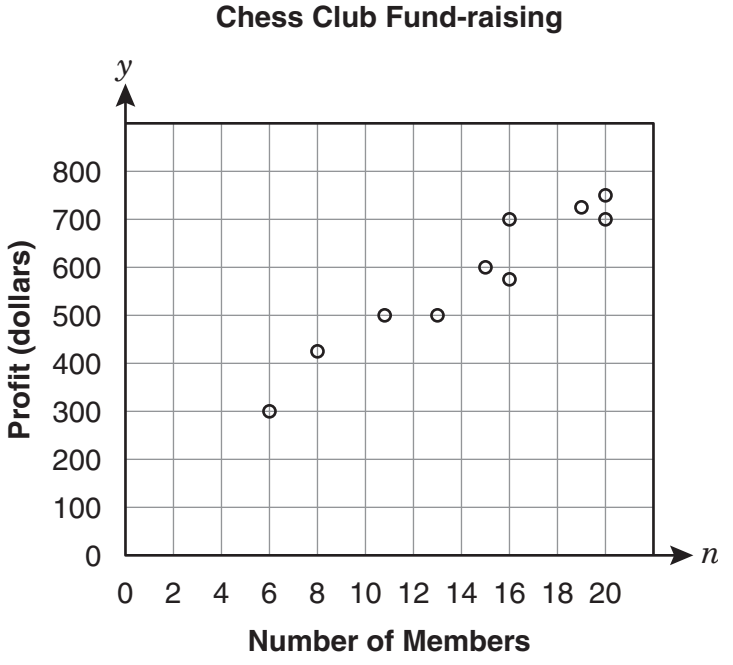
Approximate width of the strip is 6 m

Score:
0

Annotation:

The student shows little or no understanding of determining the area of a triangle and finding the width of two rectangles whose total area approximately is the same as the triangle. The response shows an incorrect width of 3 m and no relevant supporting work. This response earns zero points.

8 Vance graphed the relation between fund-raising profits for the chess club and the number of members.



Which equation represents the data displayed on the graph?

○ **A.** $y = 29n + 180$

○ **B.** $y = 60n + 180$

○ **C.** $y = \frac{2}{3}n + 180$

○ **D.** $y = \frac{200}{3}n + 180$

Item Information

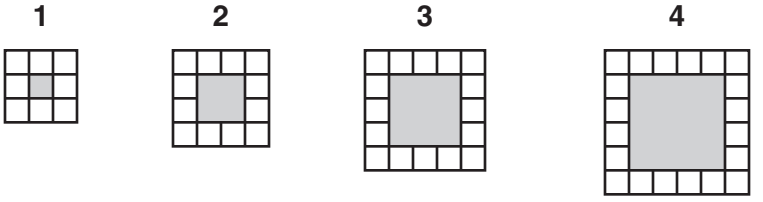
Score Points: 1

Key: A

Tools: X

Strand and Target PS03 (Data Representation and Interpretation): Draw a reasonable line to describe the data represented by a scatter plot and determine whether a straight line is an appropriate way to describe the trend in the data; read and interpret data presented in tables of ordered pairs and scatter plots and make predictions based on the given data; use statistics to support different points of view or evaluate a statistical argument based on data (1.4.5, 1.4.6)

9 Mrs. Morris gave her students this pattern of white tiles:



She asked her students to write an equation to represent the number of white tiles, t, for any figure number, n.

Which equation represents the number of white tiles in the pattern?

○ **A.** $t = n + 2$

○ **B.** $t = n + 4$

○ **C.** $t = 4n + 4$

○ **D.** $t = 4n + 8$

Item Information

Score Points: 1

Key: C

Tools: X

Strand and Target AS01 (Patterns and Functions): Recognize, extend, or create a pattern or sequence of pairs of numbers representing a linear function; identify or write a rule to describe a pattern, sequence, and/or a linear function (1.5.1, 1.5.2)

10 Mike kept track of the number of passengers on his bus, noticing the following:

– At the first stop, several passengers (p) got on the empty bus.
– At the second stop, the number of passengers doubled when more people got on.
– At the third stop, 3 passengers got off the bus and no passengers got on.
– At the fourth stop, 2 passengers got on the bus and no passengers got off.

Which expression represents the number of passengers on the bus after the fourth stop?

○ **A.** $2p + 5$

○ **B.** $2p - 1$

○ **C.** $2p - 5$

○ **D.** $2p + 1$

Item Information

Score Points: 1

Key: B

Tools: X

Strand and Target AS02 (Symbols and Notations): Represent relationships between quantities using squares, cubes, and square roots; use variables to write expressions, linear equations, and inequalities that represent situations involving rational numbers, whole number powers, and square and cube roots (1.5.3, 1.5.4)

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.

Based on the increased number of cats, how many mice are in the barn? _____

Item Information

Score Points: 2

Tools: X

Strand and Target NS02 (Ratio and Proportion): Demonstrate understanding of and apply the concepts of ratio, percent, and both direct and inverse proportion (1.1.4)

Scoring Guide for item number 14

A 2-point response: The student shows understanding of using inverse proportion to determine a number by doing the following:

- shows supporting work that uses inverse proportions
- writes 30.

A 1-point response: The student does one of the following:

- shows supporting work that uses inverse proportions and could lead to finding the answer
- writes 30.

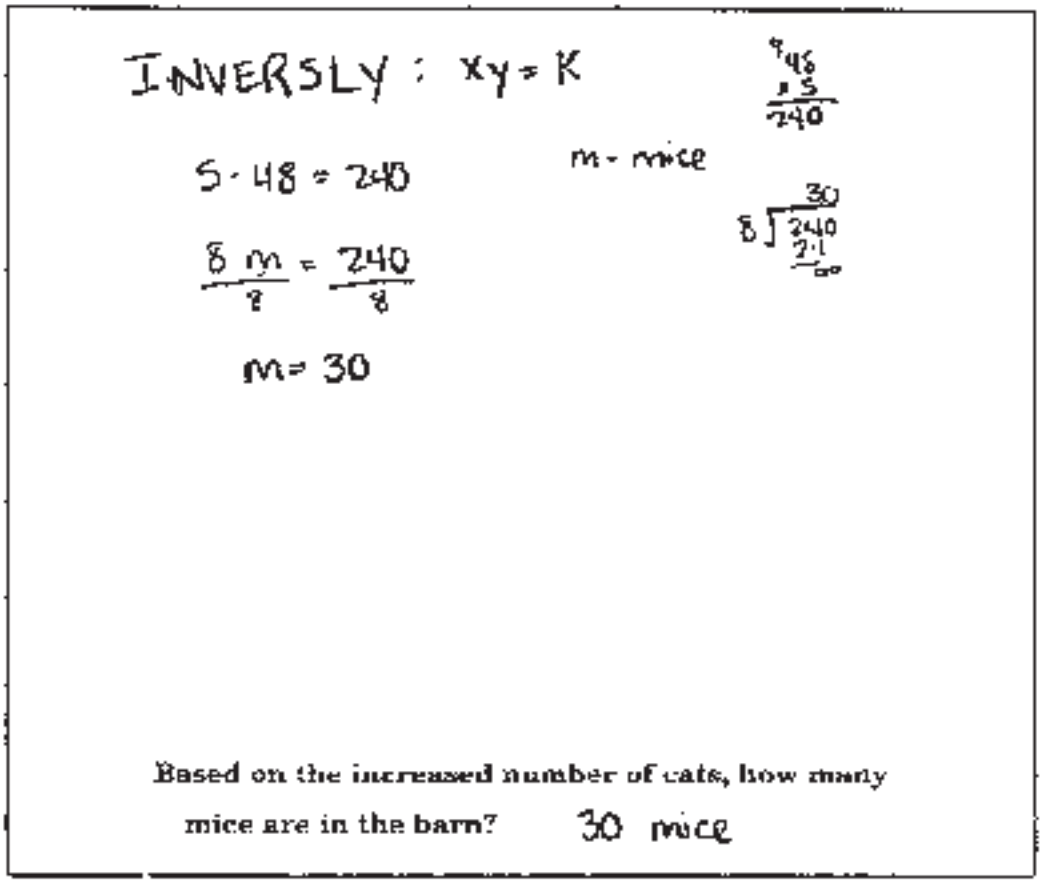
A 0-point response: The student shows very little or no understanding of using inverse proportion to determine a number.

NOTE: A ratio or table may be used to indicate the inverse.

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.



Annotation for example 2-point response:

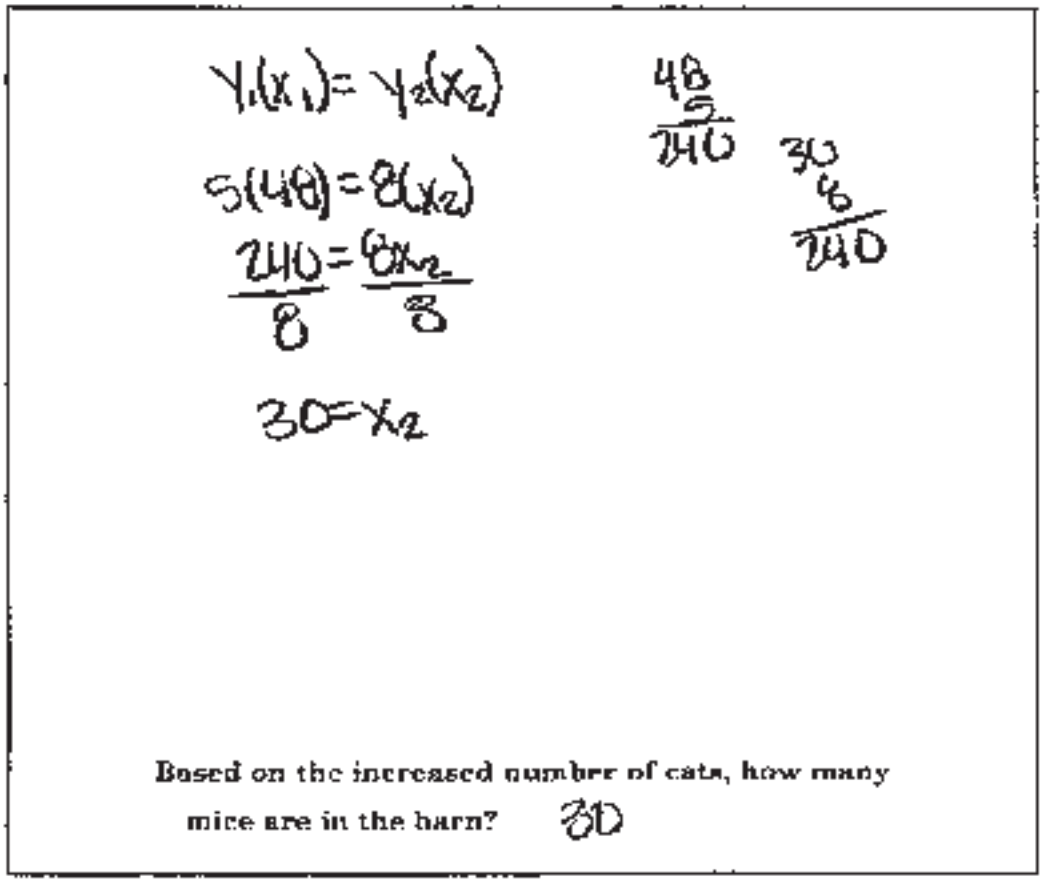
The student shows understanding of using inverse proportion to determine a number by showing supporting work that uses inverse proportions: " $xy = k \rightarrow 5 \cdot 48 = 240$; $m = mice$, $8m = 240 \rightarrow m = 30$." Writes a correct answer of *"30 mice."* This response earns two points.

2007 Mathematics Sample Items

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.



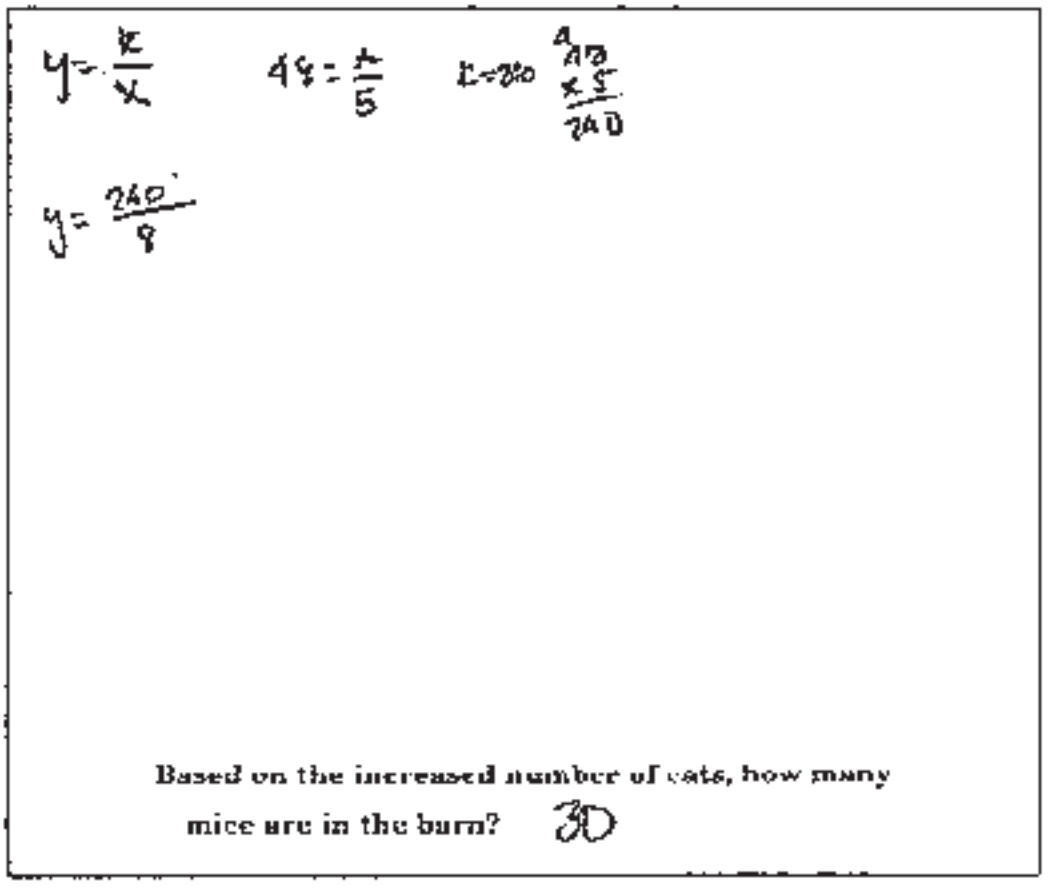
Annotation for example 2-point response:

The student shows understanding of using inverse proportion to determine a number by showing supporting work that uses inverse proportions: "$y_1(x_1) = y_2(x_2) \rightarrow 5(48) = 8(x_2) \rightarrow 30 = x_2$." Writes a correct answer of *"30."* This response earns two points.

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.



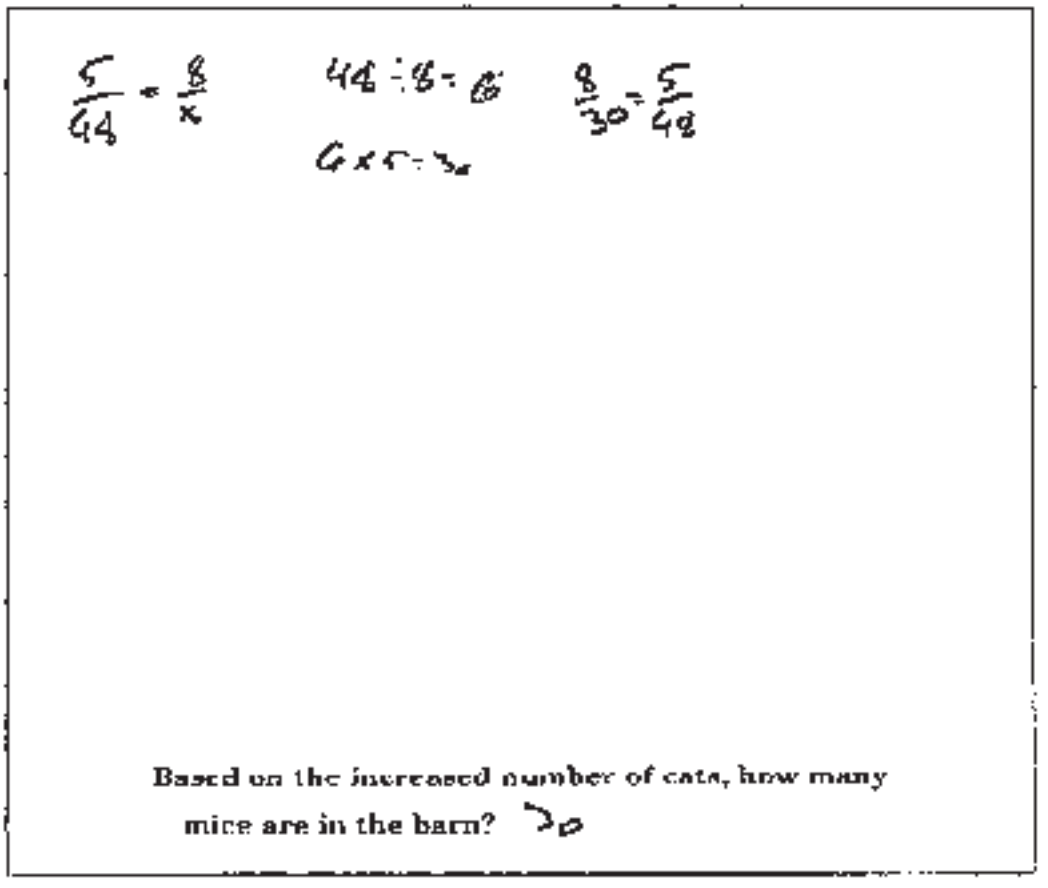
Annotation for example 2-point response:

The student shows understanding of using inverse proportion to determine a number by showing supporting work that uses inverse proportions: "$y = \frac{k}{x} \rightarrow y = \frac{240}{8}$." Writes a correct answer of *"30."* This response earns two points.

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.



Annotation for example 1-point response:

The student shows partial understanding of using inverse proportion to determine a number by writing a correct answer of *"30."* The student does the arithmetic correctly "$48 \div 8 = 6 \rightarrow 6 \times 5 = 30$," but writes two contradictory proportions.

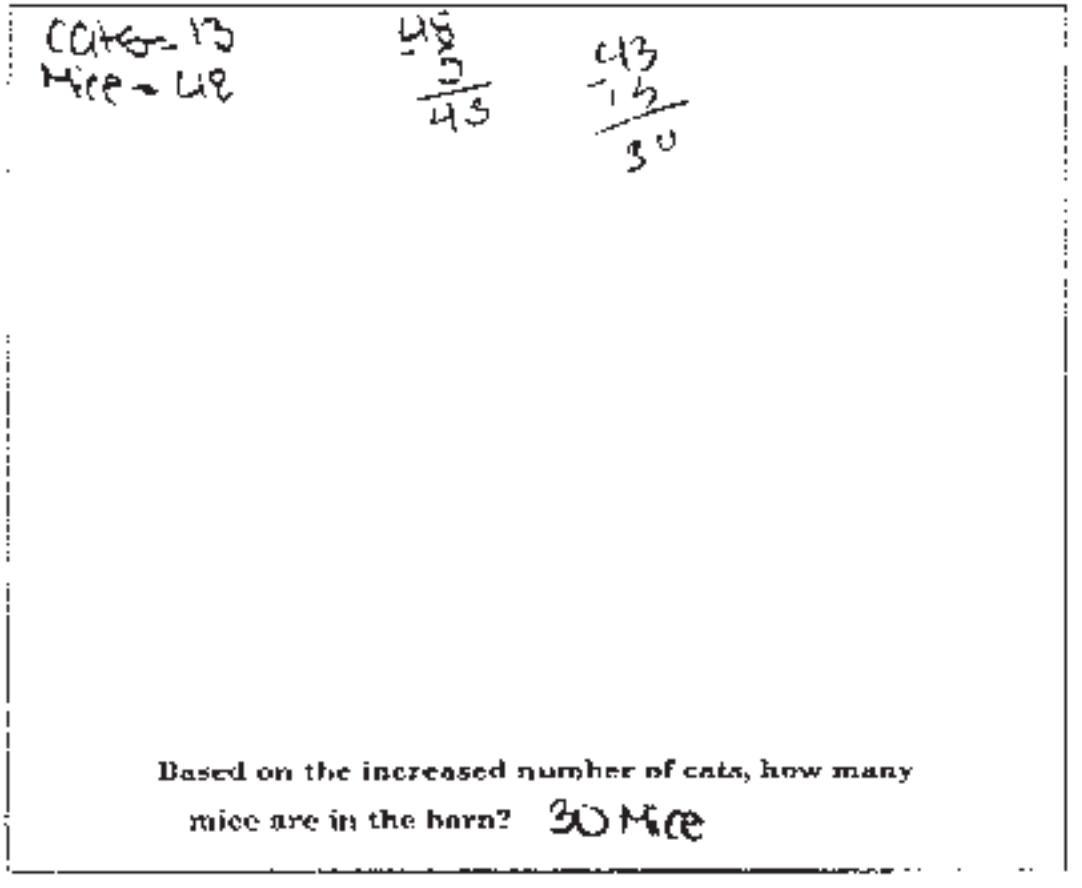
This response earns one point.

2007 Mathematics Sample Items

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.



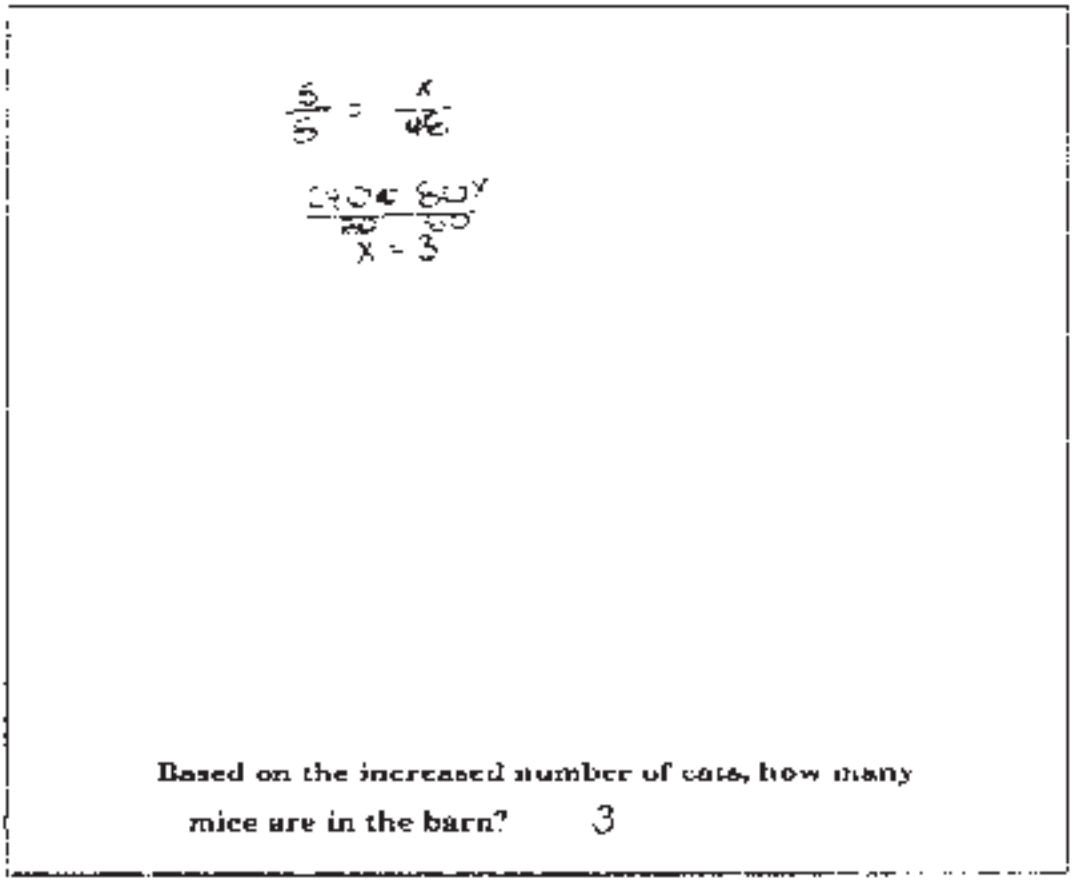
Annotation for example 1-point response:

The student shows partial understanding of using inverse proportion to determine a number by writing a correct answer *"30 Mice."* However, the supporting work is incorrect. This response earns one point.

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.



Annotation for example 1-point response:

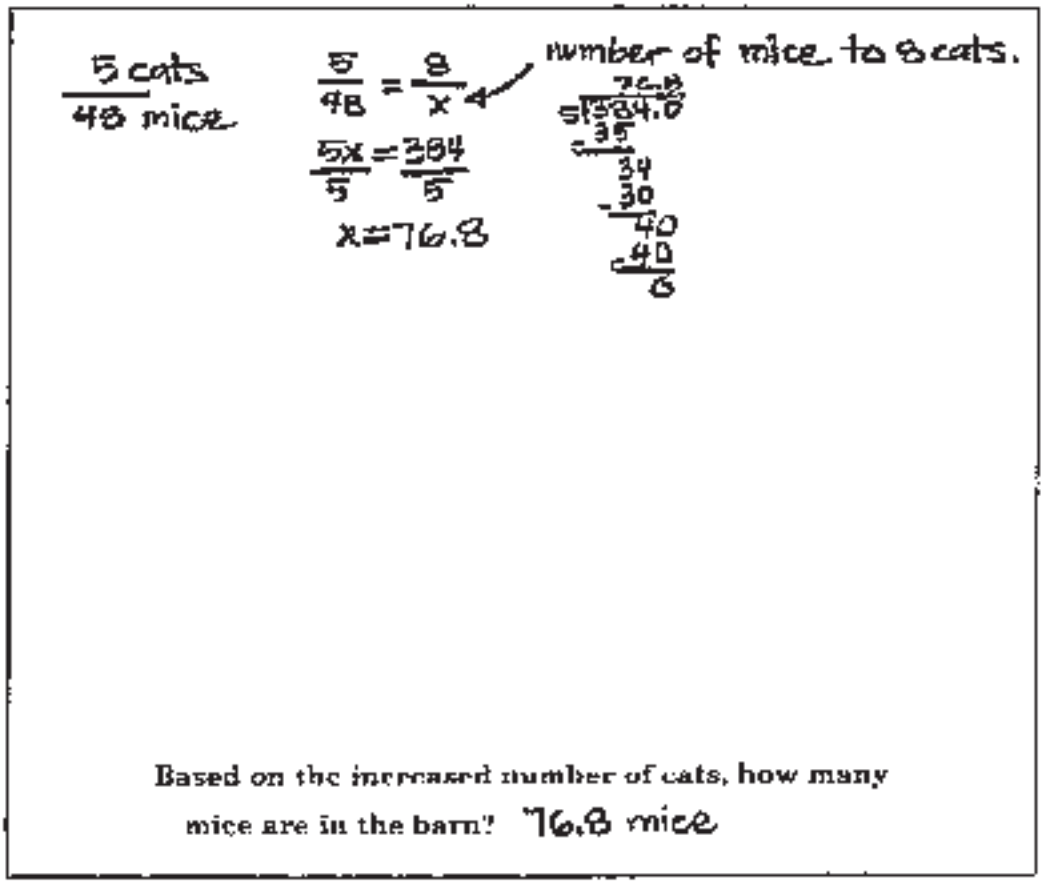
The student shows partial understanding of using inverse proportion to determine a number by showing supporting work that uses inverse proportions: "$\frac{5}{8} = \frac{x}{48}$." Writes an incorrect answer "*3.*" This response earns one point.

2007 Mathematics Sample Items

14 In Pedro's barn, the number of mice is **inversely proportional** to the number of cats. When he owned 5 cats, there were 48 mice in the barn. He increased the number of cats to 8.

Based on the **increased** number of cats, how many mice are in the barn?

Show your work using words, numbers, and/or diagrams.



Annotation for example 0-point response:

The student shows little or no understanding of using inverse proportion to determine a number. The equation shown is a direct proportion with a solution of 76.8, but the answer *"76.8 mice"* is incorrect. This response earns zero points.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.

How many chocolate cones were sold that day? _____

Item Information

Score Points: 2

Tools: Y

Strand and Target AS03 (Evaluating and Solving): Simplify expressions; solve multi-step equations, systems of equations, and one-step inequalities (1.5.5, 1.5.6)

Scoring Guide for item number 18

A 2-point response: The student shows understanding of writing and solving a system of equations by doing the following:

- writes equations to determine the number of chocolate cones sold; $c = 1 + 4v$ and $c + v = 121$ or equivalent
- shows work that supports how the number of chocolate cones was determined
- writes 97.

NOTE: Equations can be written using variables other than c and v if the variables are defined and used consistently in both equations.

A 1-point response: The student does one of the following:

- writes $c = 1 + 4v$ or equivalent
- writes equation in one variable $1 + 4v + v = 121$, or equivalent
- writes 97.

NOTE: Allow for any variables that are used consistently in both equations.

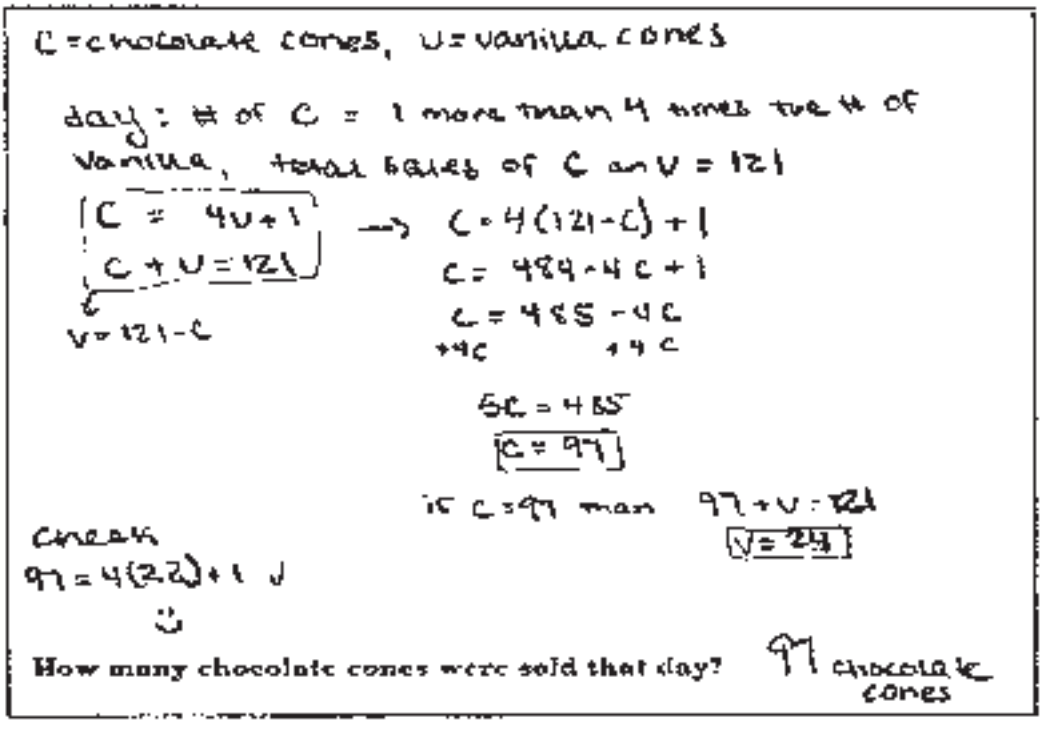
A 0-point response: The student shows very little or no understanding of writing and solving a system of equations.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.



Annotation for example 2-point response:

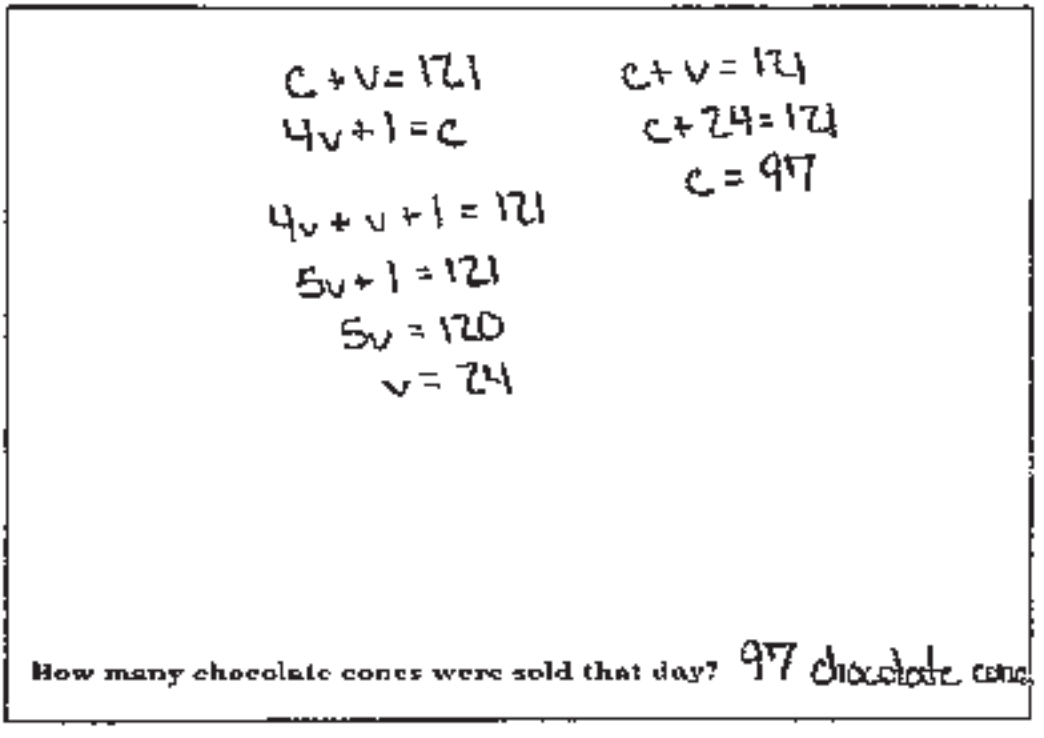
The student shows understanding of writing and solving a system of equations by writing *"c = 4v + 1"* and *"c + v = 121."* The student shows work to solve equations and checks work. Student writes a correct answer of *"97 chocolate cones."* This response earns two points.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.



Annotation for example 2-point response:

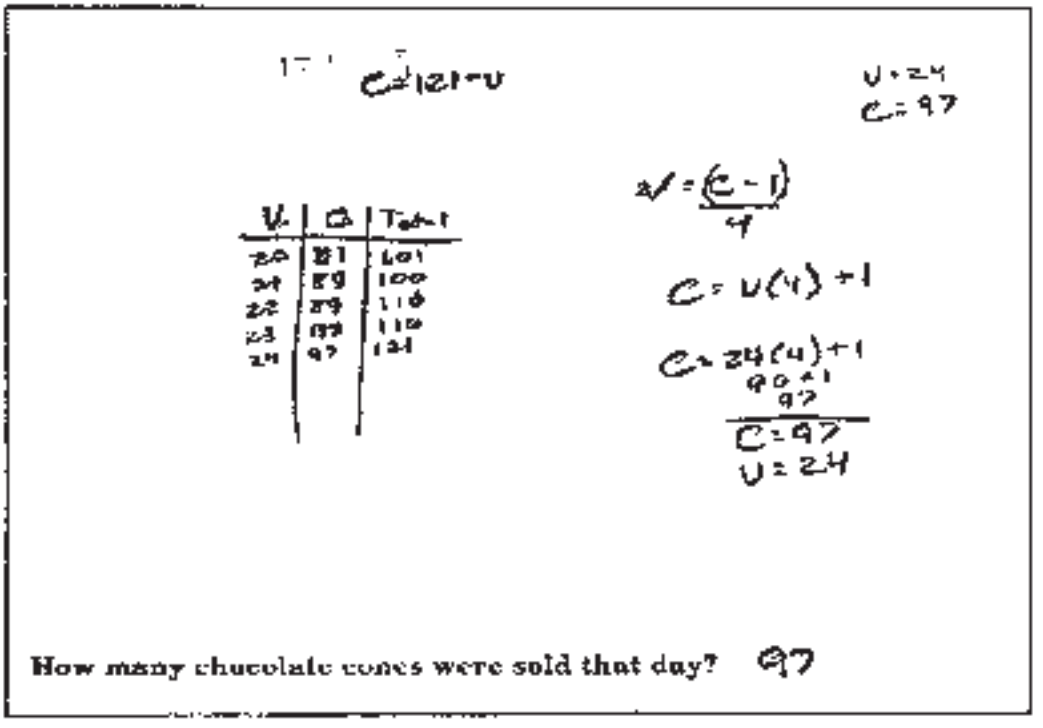
The student shows understanding of writing and solving a system of equations by writing *"4v + 1 = c"* and *"c + v =121."* Shows work to solve equations algebraically. Student writes a correct answer of *"97 chocolate cones."* This response earns two points.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.



Annotation for example 2-point response:

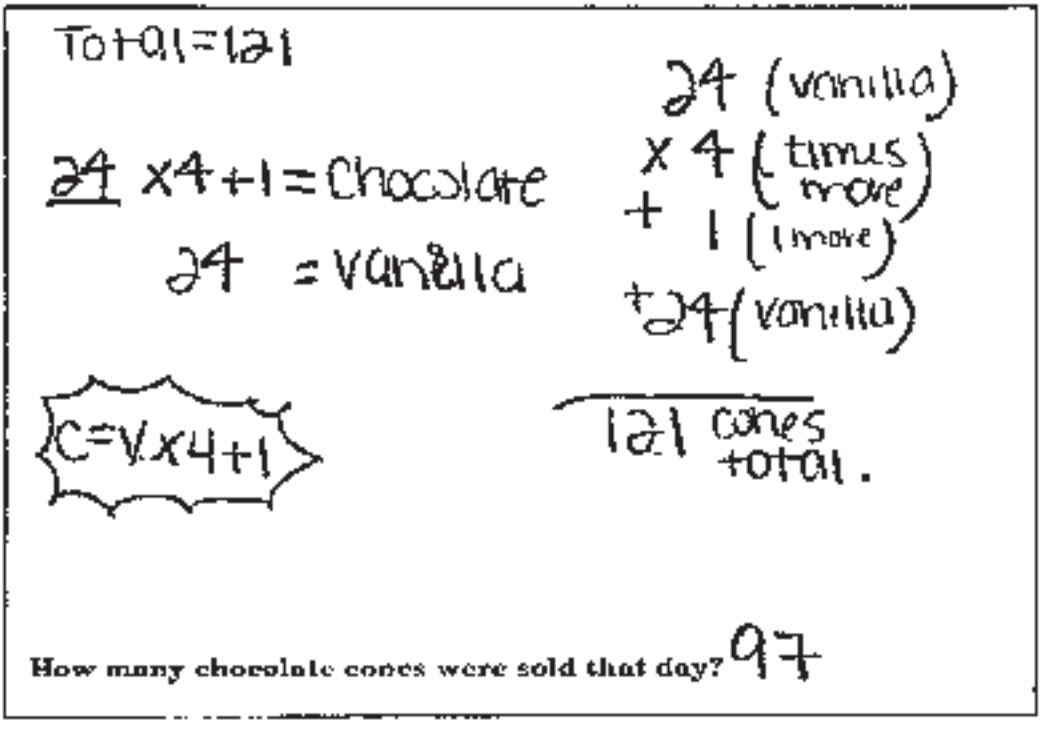
The student shows understanding of writing and solving a system of equations by writing "$c = 121 - v$" and "$v = \frac{(c-1)}{4}$." The student uses guess and check to determine "$v = 24$" and then substitutes in the second equation. The student writes a correct answer of *"97."* This response earns two points.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.



Annotation for example 1-point response:

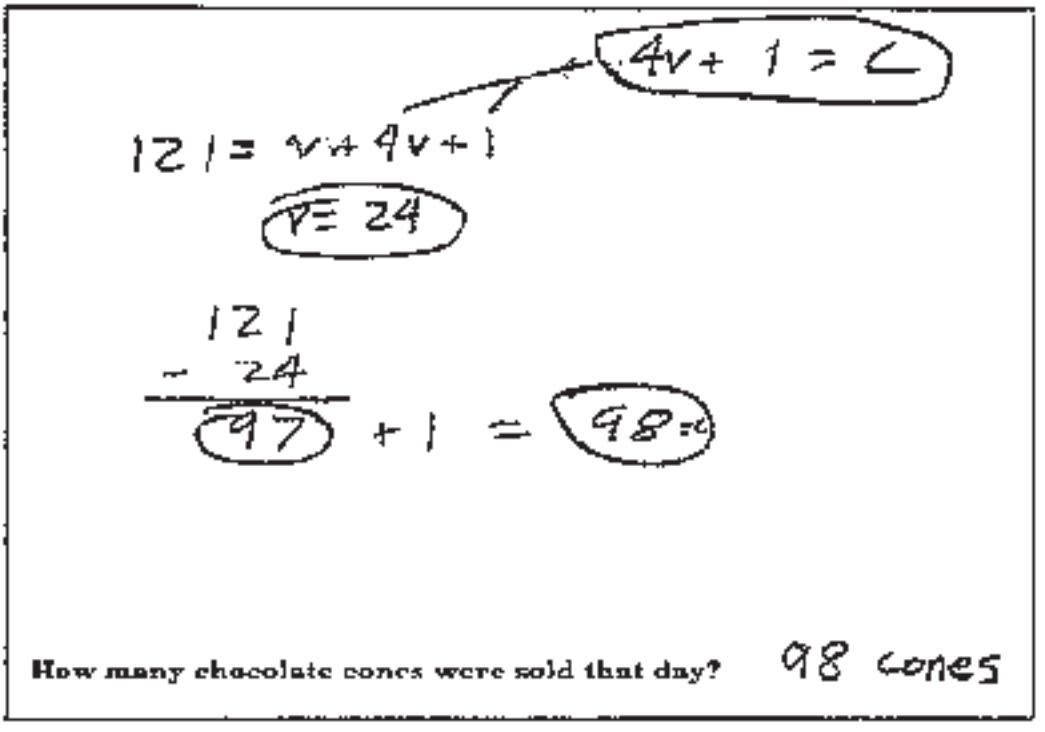
The student shows partial understanding of writing and solving a system of equations by writing "$c = v \times 4 + 1$." The student uses 24 for v but shows no supporting work to determine 24. The student writes a correct answer of *"97."* This response earns one point.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.



Annotation for example 1-point response:

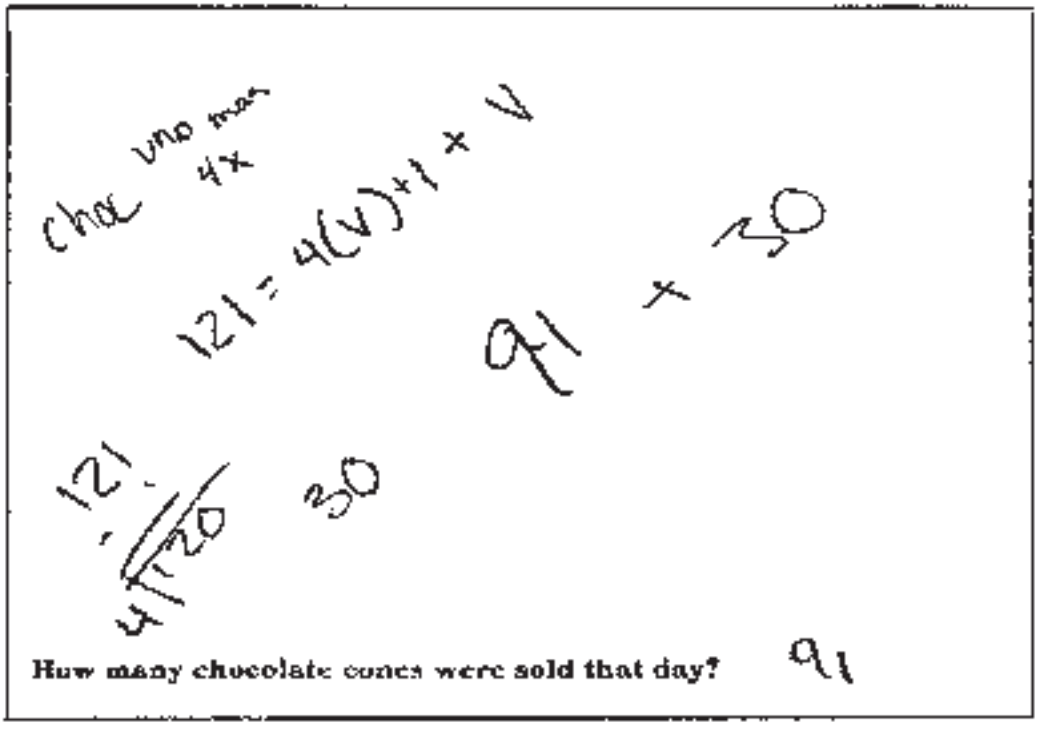
The student shows partial understanding of writing and solving a system of equations by writing *"4v + 1 = c"* and *"121 = v+ 4v + 1."* The student writes an incorrect answer of *"98."* This response earns one point.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.



Annotation for example 1-point response:

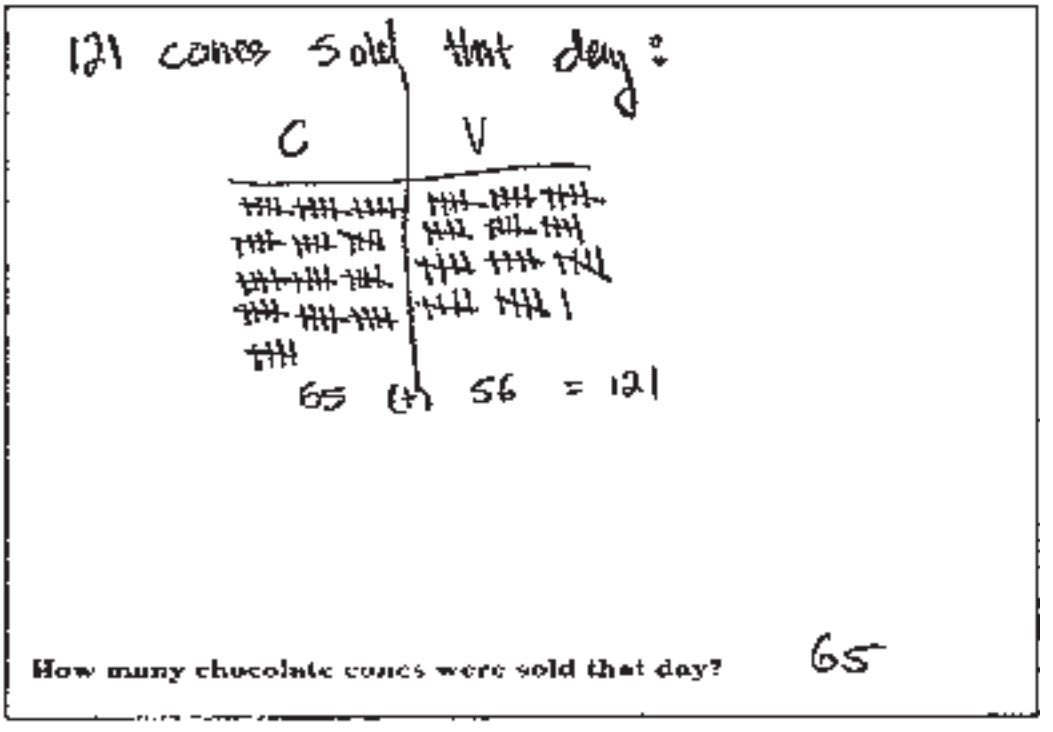
The student shows partial understanding of writing and solving a system of equations by writing *"121 = 4(v) + 1 + v,"* which is a combination of both equations. The student writes an incorrect answer of *"91."* This response earns one point.

18 Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.



Annotation for example 0-point response:

The student shows little or no understanding of writing and solving a system of equations. The student uses tallies to find a solution to one of the equations, $c + v = 121$. The student writes an incorrect answer of *"65."* This response earns zero points.

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.

How many total hours did Jay work last week? _____

Item Information

Score Points: 2

Tools: Y

Strand and Target SR02 (Construct Solutions): Select and organize relevant information; use appropriate concepts and procedures from number sense, measurement, geometric sense, probability and statistics, and algebraic sense; use a variety of strategies and approaches; determine whether a solution is viable, mathematically correct; and answers the question(s) asked (2.2.1, 2.2.2, 2.2.3, 2.2.4)

2007 Mathematics Sample Items

Scoring Guide for item number 19

A 2-point response: The student shows understanding of solving a problem by doing the following:

Understanding

- uses total pay of $903.10, hourly wage of $16.42, 2 times the hourly wage for Sunday, and 1.5 times hourly wage for hours over 40

Strategy/Procedure

- shows appropriate strategies to partition $903.10 into 3 pieces and to determine total hours worked

	Regular Wages	**Sunday Wages**	**Overtime Wages or Hours**
40 hr week + 3 hr Sunday + overtime	$16.42 x 40	2 x $16.42 x 3	$147.78
	$656.80	$98.52	$147.78 or 6 hrs
37 hr week + 3 hr Sunday + overtime	$16.42 x 37	2 x $16.42 x 3	$197.04
	$607.54	$98.52	$197.04 or 8 hrs

Answer

- writes 48 or 49.

NOTE: Allow for one incorrect intermediate answer based on a correct operation with an answer consistent with the error

A 1-point response: The student does one of the following:

- shows appropriate strategies to partition $903.10 into at least 2 pieces
- writes 48 or 49.

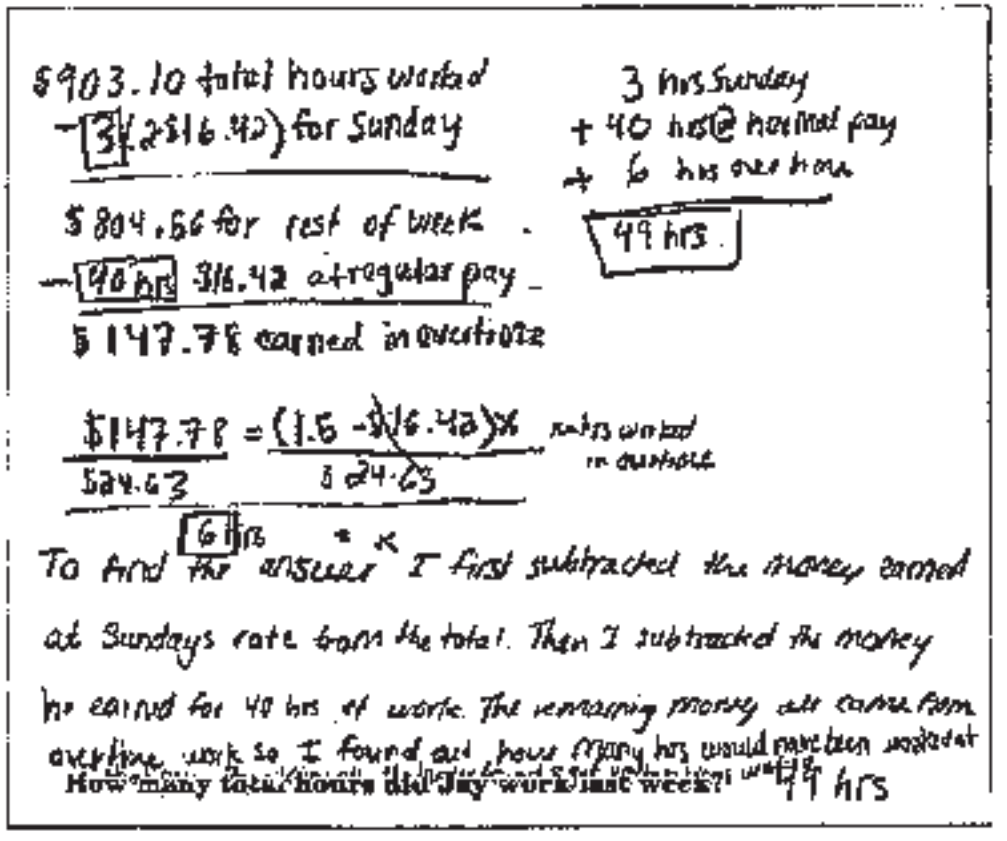
0-point response: The student shows very little or no understanding of solving a problem.

2007 Mathematics Sample Items

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.



Annotation for example 2-point response:

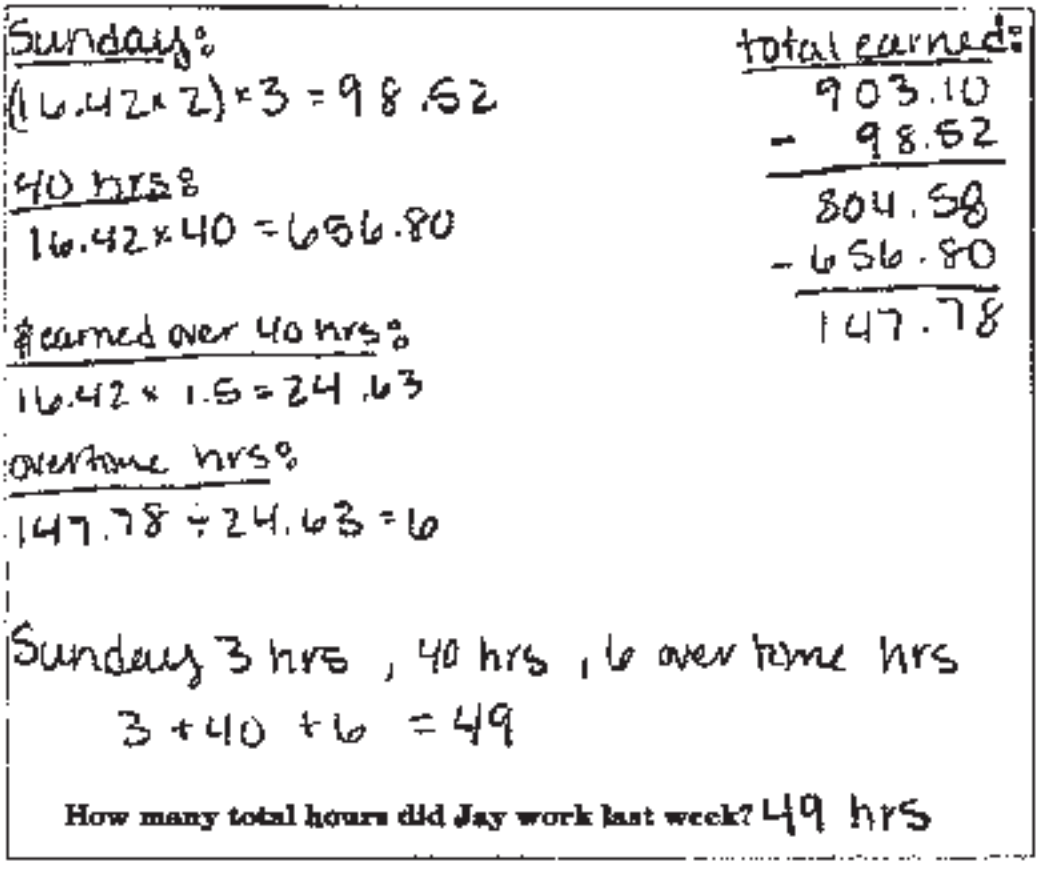
The student shows understanding of solving a problem by using the given information to determine Sunday wages, regular wages, and overtime wages. The student used the overtime wages to determine the number of overtime hours worked as 6. The student writes a correct answer of *"49 hrs."* This response earns two points.

2007 Mathematics Sample Items

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.



Annotation for example 2-point response:

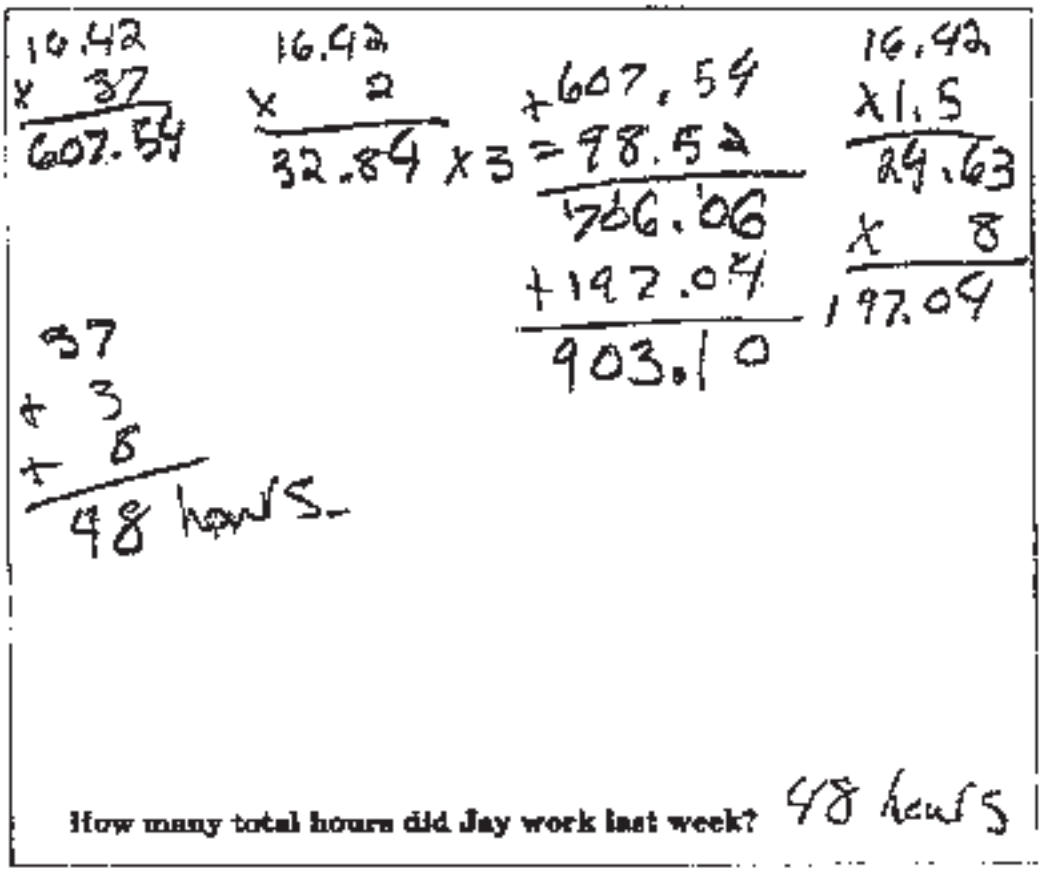
The student shows understanding of solving a problem by using the given information to determine Sunday wages, regular wages, and overtime wages. The student used the overtime wages to determine the number of overtime hours worked as 6. The student writes a correct answer of *"49 hrs."* This response earns two points.

2007 Mathematics Sample Items

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.



Annotation for example 2-point response:

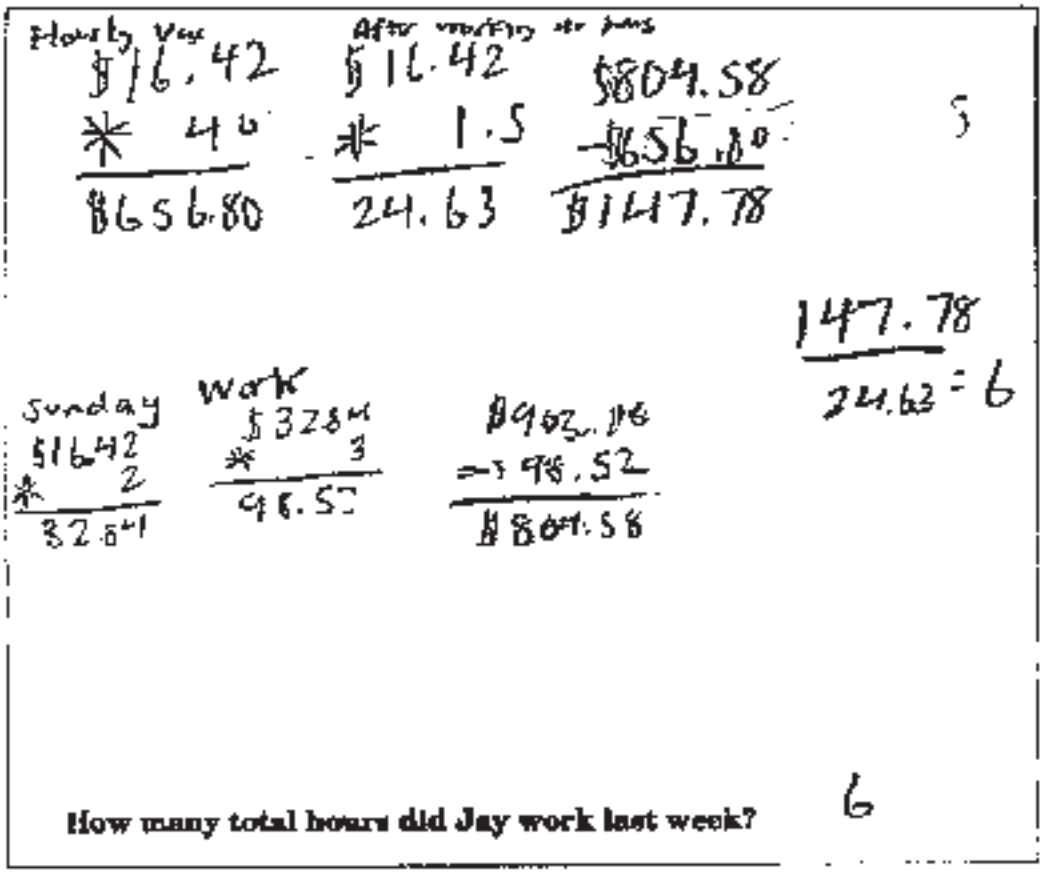
The student shows understanding of solving a problem by using the given information to determine Sunday wages, regular wages, and overtime wages. The student used 37 hours to determine regular wages and counted Sunday as part of the forty-hour work week. The student used the overtime wages to determine the number of overtime hours worked as 8. The student writes a correct answer of *"48 hrs."* This response earns two points.

2007 Mathematics Sample Items

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.



Annotation for example 1-point response:

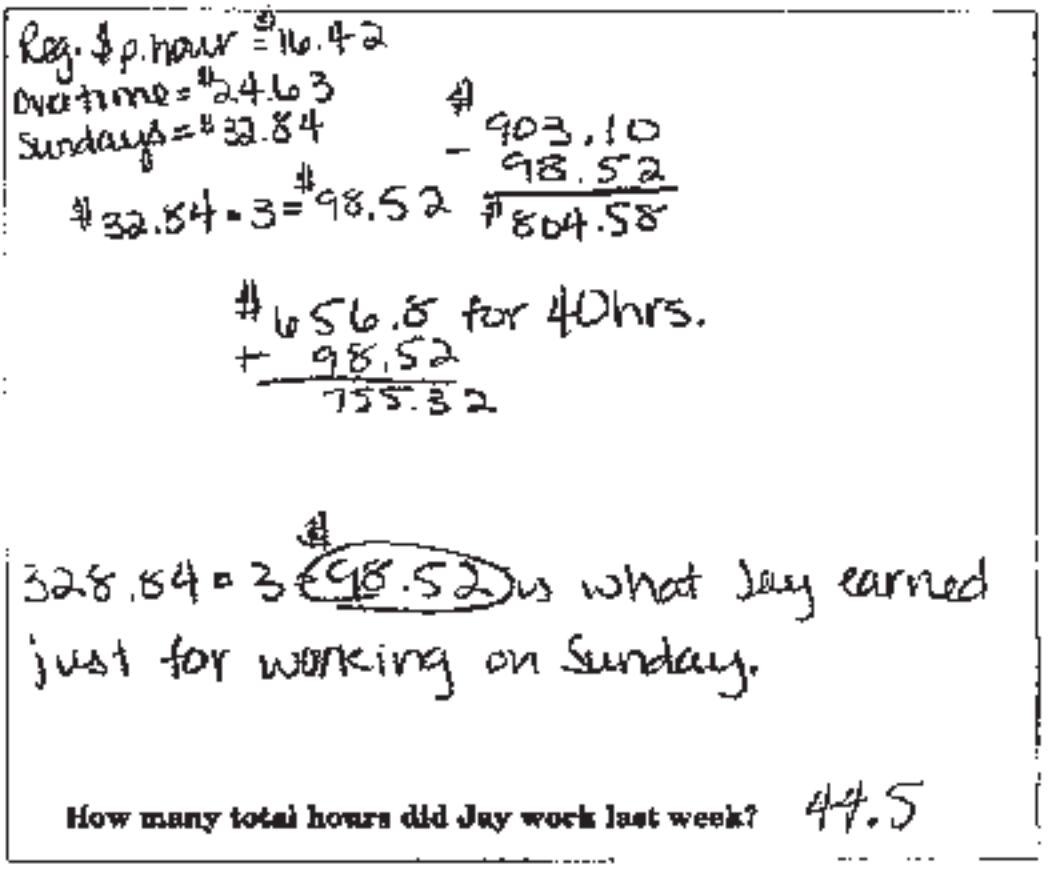
The student shows partial understanding of solving a problem by using the given information to determine Sunday wages, regular wages, and overtime wages. The student used the overtime wages to determine the number of overtime hours worked as 6. The student writes an incorrect answer of *"6"* hrs. This response earns one point.

2007 Mathematics Sample Items

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.



Annotation for example 1-point response:

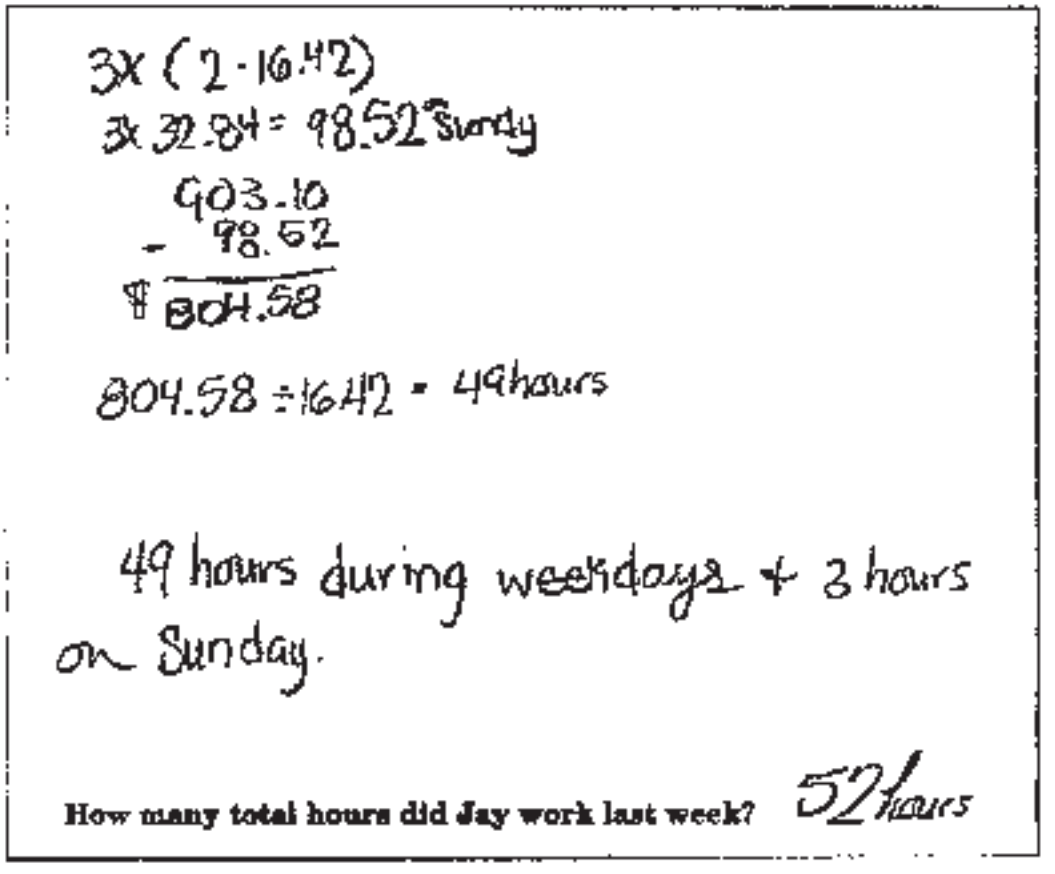
The student shows partial understanding of solving a problem by using the given information to determine Sunday wages and regular wages, but not overtime wages. The student writes an incorrect answer of *"44.5."* This response earns one point.

2007 Mathematics Sample Items

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.



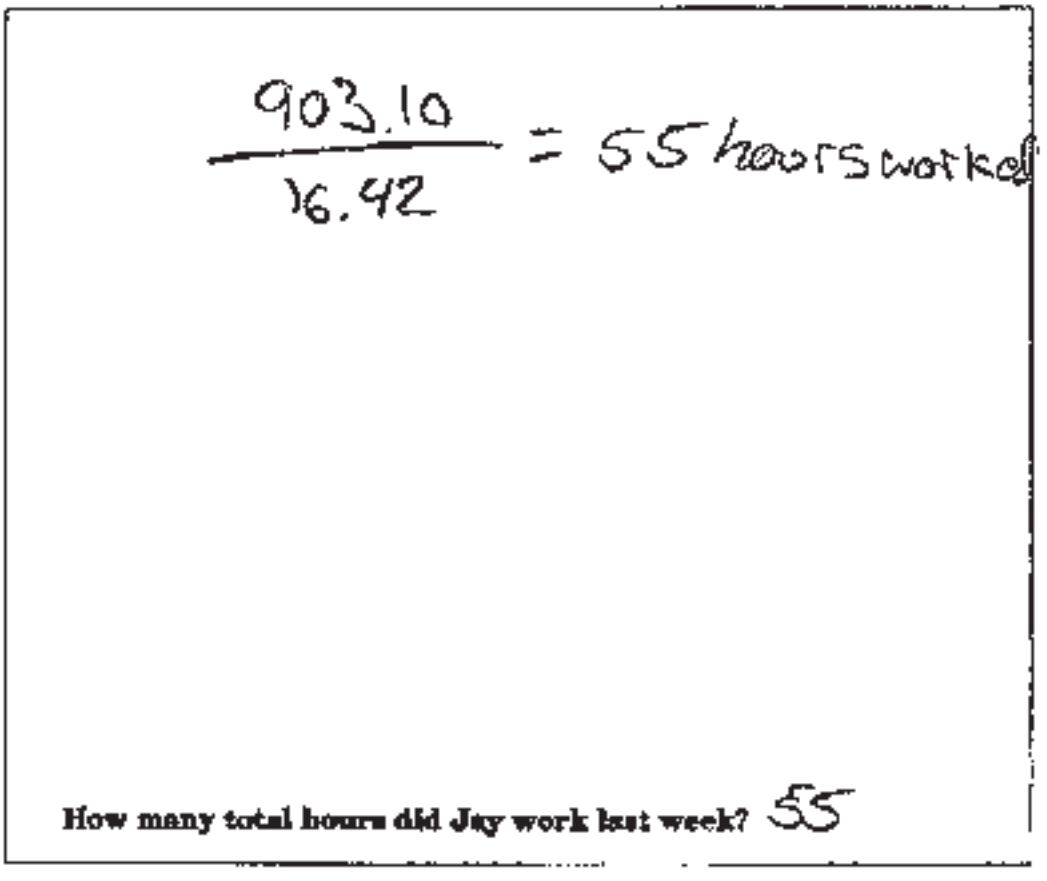
Annotation for example 1-point response:

The student shows partial understanding of solving a problem by using the given information to determine Sunday wages and regular wages, but not overtime wages. The student subtracted Sunday wages from 903.10 and used that number to determine the number of regular hours worked, *"804.58 ÷ 16.42 = 49 hours*." The student completely neglects overtime and writes an incorrect answer of *"52 hours."* This response earns one point.

19 Jay earns $16.42 per hour. He earns 1.5 times his hourly wage for every hour he works over 40 hours each week. He earns 2 times his hourly wage on Sunday. Jay worked 3 hours on Sunday and earned a total of $903.10 for the week.

How many total hours did Jay work last week?

Show your work using words, numbers, and/or diagrams.



Annotation for example 0-point response:

The student shows little or no understanding of solving a problem. The student divides the total wages by the hourly wage for regular hours, "$\frac{903.10}{16.42} = 55$ *hours worked*." The student writes an incorrect answer of "*55*." This response earns zero points.

6 Two-hundred items were sold at a snack stand for a total of $130.00. The only items sold were cans of pop for $0.50 and bags of popcorn for $0.75.

How many of each item were sold?

○ **A.** 120 cans of pop, 80 bags of popcorn

○ **B.** 80 cans of pop, 120 bags of popcorn

○ **C.** 160 cans of pop, 40 bags of popcorn

○ **D.** 40 cans of pop, 160 bags of popcorn

Item Information

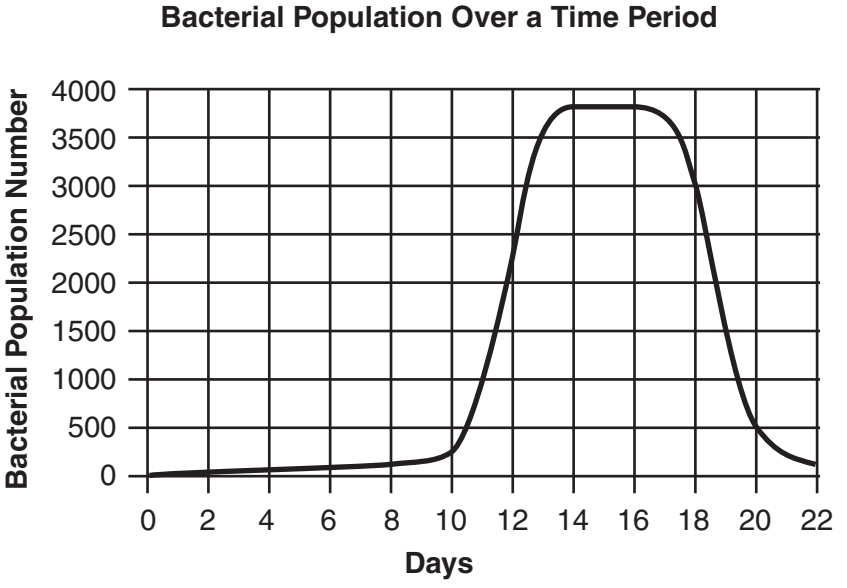
Score Points: 1

Key: B

Tools: X

Strand and Target AS03 (Evaluating and Solving): Simplify expressions; solve multi-step equations, systems of equations, and one-step inequalities (1.5.5, 1.5.6)

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

Additional work space

2008 Mathematics Sample Items

Item Information

Score Points: 4

Tools: X

Strand and Target CU01 (Gather Information): Develop or select an efficient system for collecting mathematical information for a given purpose; extract mathematical information for a given purpose from multiple sources using reading and observation (4.1.1, 4.1.2)

Scoring Guide for item number 10

A 4-point response: The student shows understanding of extracting and explaining mathematical information from a graph by doing the following:

Initial Growth

- identifies the time period ending at 9 or 10 days
- identifies the population count ending between 200 and 300, inclusive, or describes the change in population

Rapid Growth

- identifies the time period beginning at 9 or 10 days and ending at 13 or 14 days
- identifies the initial population between 200 and 300, inclusive, and the final population between 3700 and 3800, inclusive, or describes the change in population

No Growth

- identifies the time period beginning at 13 or 14 days and ending at 16 or 17 days
- identifies the population as a number between 3700 and 3800, inclusive, or identifies or shows that the population remains constant

Decline

- identifies the time period beginning at 16 or 17 days
- identifies or shows evidence the initial population is between 3700 and 3800, inclusive, and identifies the final population is between 50 and 500, inclusive, or describes the change in population.

NOTE: The mathematical language used to describe the graph must refer to the population of the bacteria. Points will not be given for descriptions that describe the movement of the curve.

A 3-point response: The student states three time periods and describes the changes in population during the time periods.

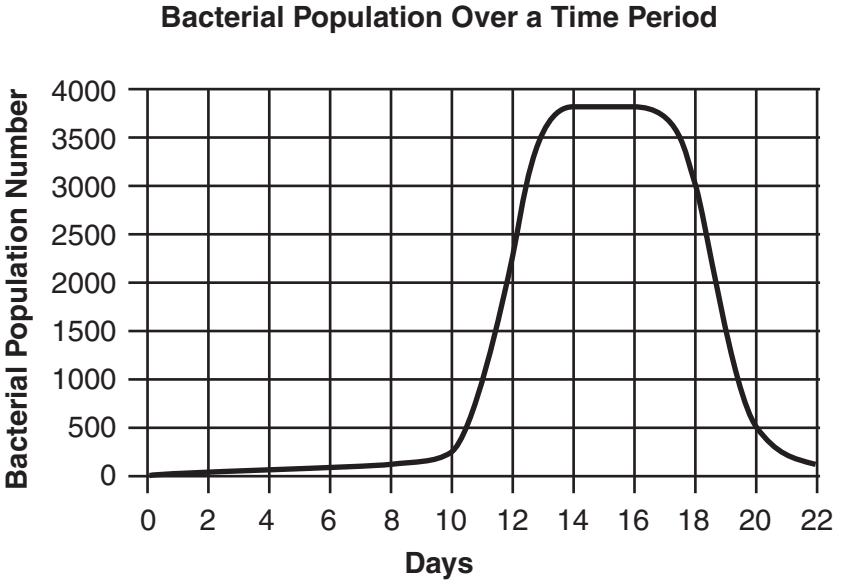
A 2-point response: The student states two time periods and describes the changes in population during the time periods.

A 1-point response: The student does one of the following:

- states one time period and describes the change in population during the time period
- states the 4 time periods
- describes the 4 changes, in sequence, in bacterial population
- creates a table or writes a description of a table that includes at least 5 data points.

A 0-point response: The student shows very little or no mathematical understanding of extracting and explaining mathematical information from a graph.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

Additional work space

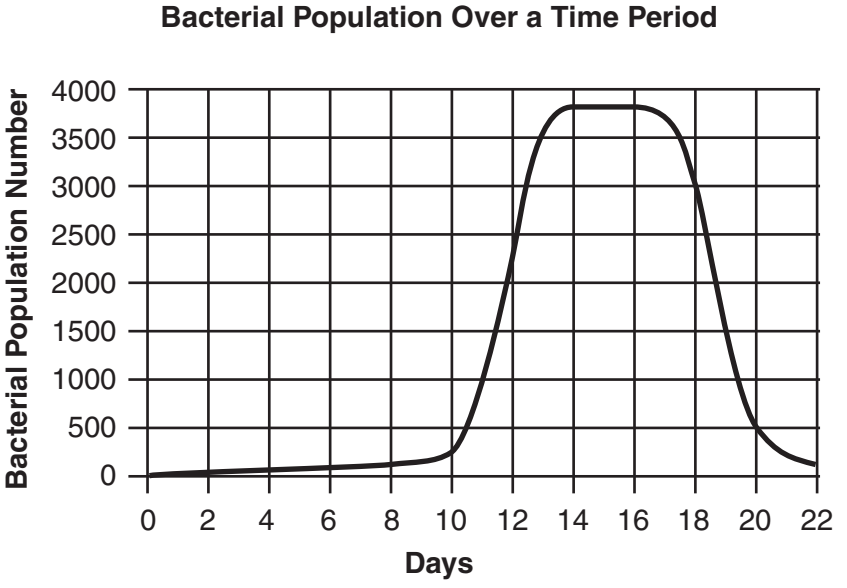
The population of the bacteria slowly began to increase at a steady rate until the 10th day when the population sharply increased from about 950 to about 3780 by the 14th day. After the 14th day the population stayed at about 3800 until the 17th day when the population dropped drastically. Over a four day period the population decreased by 3,300 bacteria. After day 20 the rate of decrease became more gradual

2008 Mathematics Sample Items

Annotated example for a 4-point response for question number 10:

The student shows understanding of extracting and explaining mathematical information from a graph by identifying the time period "*until the 10th day,*" identifying the population count "*250*" and describing the change in population "*slowly began to increase*" for the **Initial Growth** phase; identifying the time period "*the 10th day…by the 14th day,*" identifying the initial population "*250*" and the final population "*3750*" and describing the change in population "*sharply increased*" for the **Rapid Growth** phase; identifying the time period "*the 14th day…until the 17th day,*" identifying the population "*3800*" and identifying that the change in population remains constant "*stayed at about 3800*" for the **No Growth** phase; and identifying the time period "*17th day*" and indicating that the time period goes beyond day 17 "*Over a four day period,*" and identifying the initial population "*3800*" and final population "*decreased by 3,300*" and describing the change in population "*dropped drasticly*" for the **Decline** phase. This response earns four points.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

10 days = 200 bactena
Sudden change at 10 days
day 10 to 14 = 3500 bacteria increase
day 13 to 17 = same at 3700
day 17 drop
days 17 to 20 = 3000 drop

Additional work space

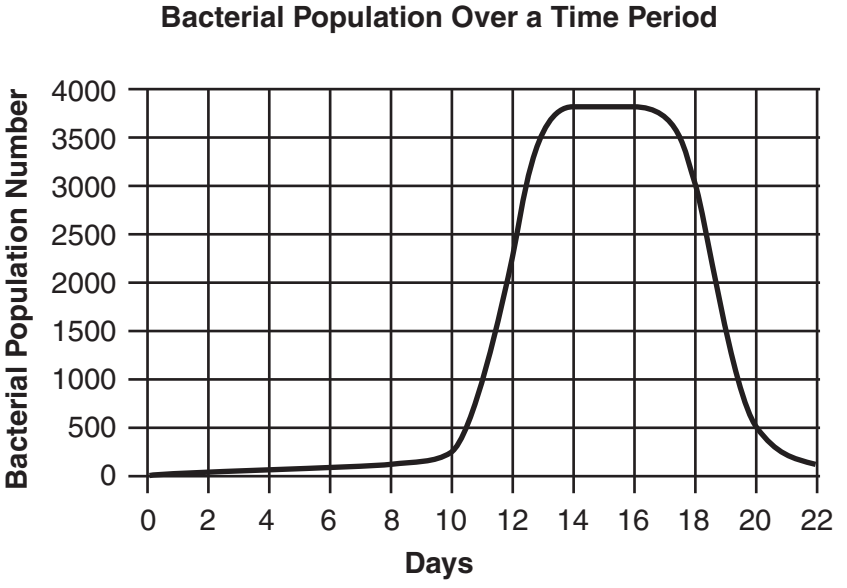
day 21 = 200 bactena

The bactena was at a steady rise until day 10 when it shot up and came to it's peak at about day 14 and was steady till day 16 until it suddenly droped at about day 17 and came back down to it's normal at about day 20.

Annotated example for a 4-point response for question number 10:

The student shows understanding of extracting and explaining mathematical information from a graph by identifying the time period "*until day 10*" and describing the change in population "*steady rise*" (by using the number 200 from the first page of the response, 'steady' is an acceptable descriptive for 'rise') for the **Initial Growth** phase; identifying the time period "*day 10 to 14*" and describing the change in population "*shot up*" for the **Rapid Growth** phase; identifying the time period "*day 14…till day 16*" and identifying that the change in population remains constant "*was steady*" for the **No Growth** phase; and identifying the time period "*about day 17*" and indicating that the time period goes beyond day 17 "*at about day 20,*" and describing the change in population "*suddenly droped*" for the **Decline** phase. This response earns four points.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

From the day she started to the Tenth day the bacteria grew at a consistant Rate, but at the tenth day the bacteria shot up in numbers for about 3 days. It then didn't change for 3 days, then dropped at 16th days. By the 22 day the bacteria population was about it was at on the tenth day.

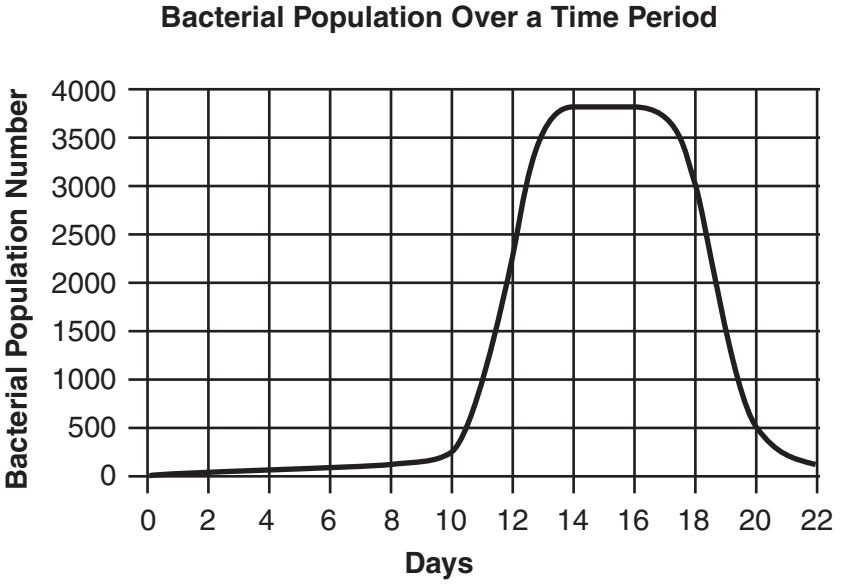
Additional work space

2008 Mathematics Sample Items

Annotated example for a 3-point response for question number 10:

The student shows partial understanding of extracting and explaining mathematical information from a graph by identifying the time period "*the tenth day…for about 3 days*" and describing the change in population "*shot up*" for the **Rapid Growth** phase; identify the time period "*for 3 days…16 1/2 days*" and identifying that the change in population remains constant "*didn't change*" for the **No Growth** phase; and identifying the time period "*16 1/2 days*" and indicating that the time period goes beyond day 16 1/2 "*By the 22 day,*" and describing the change in population "*droped*" for the **Decline** phase. Although the student identifies the time period for the **Initial Growth** phase "*to the tenth day,*" they do not identify the population count and the description of the change in population "*grew at a consistant Rate*" is incomplete. The word "*consistant*" does not indicate how the population changed, i.e., grew consistently fast, grew consistently slow, etc. This response earns three points.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

There was a steady climb in the bacteria population for the first 10 days. Then from 10 days until about 13 days there was a dramatic climb from 250 to about 3750o. Then the pop. leveled off then at 17 days the pop dramatically decreased from 3750o back down to about 250.

Additional work space

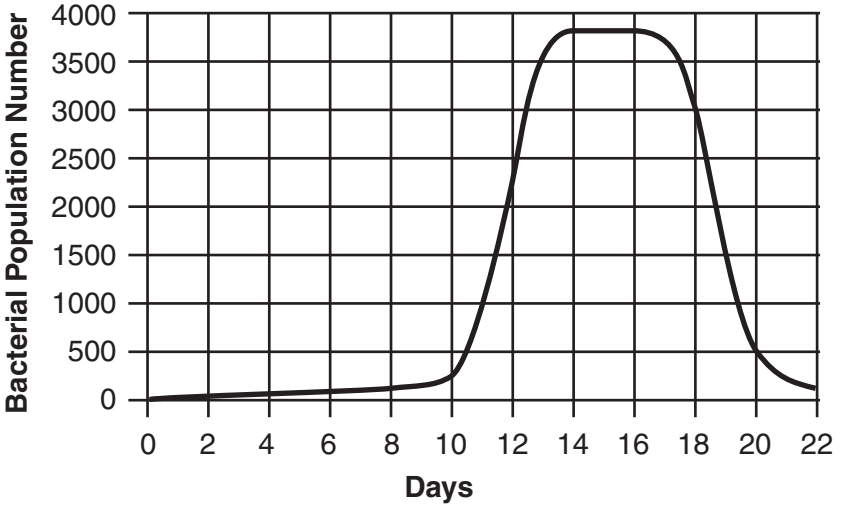
2008 Mathematics Sample Items

Annotated example for a 3-point response for question number 10:

The student shows partial understanding of extracting and explaining mathematical information from a graph by identifying the time period "*the first 10 days,*" identifying the population count "*250*" and describing the change in population "*steady climb*" (this is an acceptable description since the word "*steady*" is qualified with the population count) for the **Initial Growth** phase; identifying the time period "*13 days…then at 17 days*" and identifying that the change in population remains constant "*leveled of*" for the **No Growth** phase; and identifying the time period "*then at 17 days,*" identifying the initial population and the final population "*37500 back down to about 250*" and describing the change in population "*dramatically decreaced*" for the **Decline** phase. Since credit was not given for "*37500*" in the **Rapid Growth** phase, the response is not penalized again for using the same number in the Decline phase. Although the student identifies the time period "*from 10 days untill about 13 days,*" describes the change in population "*dramatic climb,*" and identifies the initial population "*250,*" the final population "*37500*" is not within the acceptable interval for the Rapid Growth phase. This response earns three points.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.

Bacterial Population Over a Time Period



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

FOR THE FIRST 10 DAYS, THE BACTERIA POPULATION STEADILY GREW TO ABOUT 250. AFTER DAY 10, THE BACTERIA STARTED GROWING VERY RAPIDLY TO ABOUT 3800 POPULATION IN JUST A 4 DAY PERIOD. ON ABOUT THE 18TH DAY, THE POPULATION BEGIAN

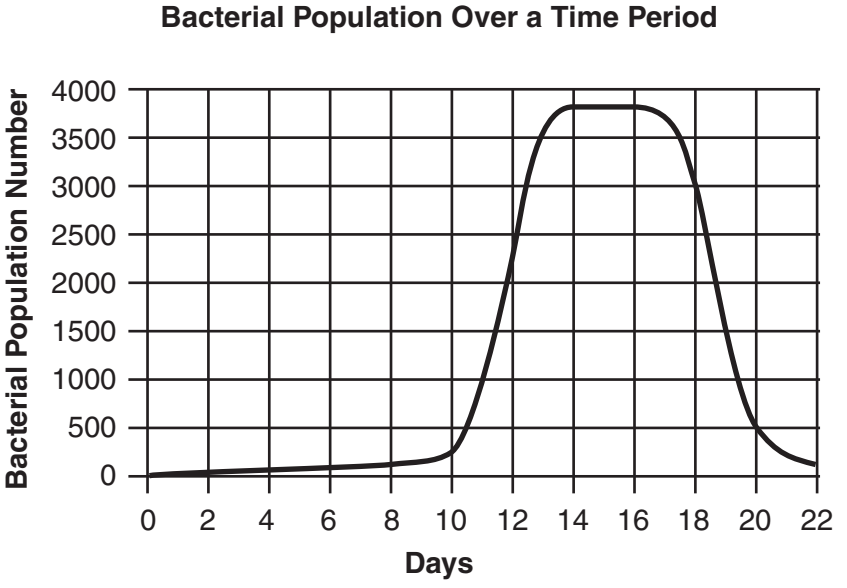
Additional work space

RAPIDLY DECREASING BACK DOWN TO ABOUT A 250 POPULATION IN JUST 2 DAYS.

Annotated example for a 2-point response for question number 10:

The student shows partial understanding of extracting and explaining mathematical information from a graph by identifying the time period "*FIRST 10 DAYS,*" identifying the population count "*250*" and describing the change in population "*StEADILY GREW*" (this is an acceptable description since the word "*STEADILY*" is qualified with the population count) for the **Initial Growth** phase; and identifying the time period "*AFTER DAY 10…IN JUST A 4 DAY PERIOD,*" identifying the initial population "*250*" and the final population "*3800,*" and describing the change in population "*STARTED GROWING VERY RAPIDLY*" for the **Rapid Growth** Phase. The No Growth phase is not addressed in the response. Although the initial and final population counts are given, along with a description of the change in population "*RAPIDLY DECREASING BACK DOWN,*" the time period for the Decline *"ON ABOUT THE 18TH DAY... IN JUST 2 DAYS"* phase is incorrect. This response earns two points.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

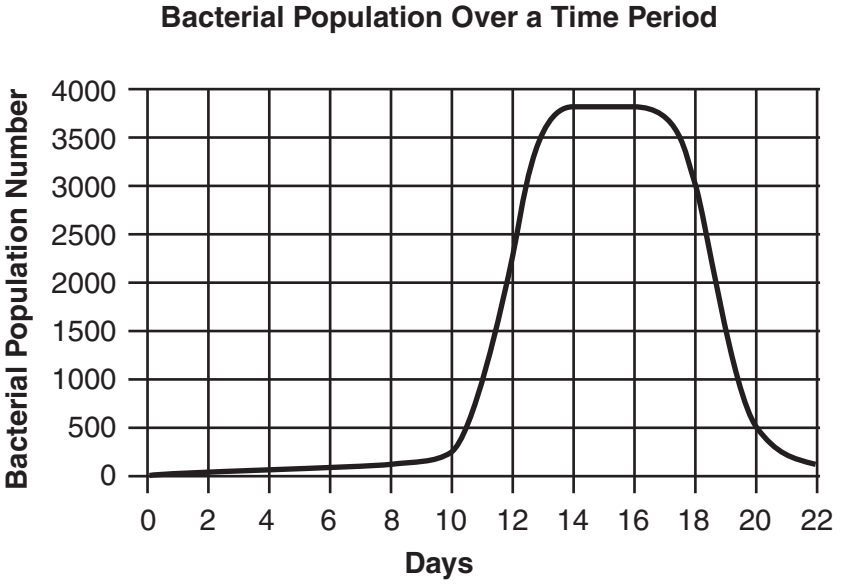
Additional work space

Maria first started her growing/observing of the bacteria on day 1. As day 2 came along there was already growth. As it went on to day 10, the bacteria growth grew at a steady pace, but sky-rocketed at day 11-13, then began to balance out for about 3-4 days. At about day 17 the bacteria growth stopped and had a down fall all the way to day 22.

Annotated example for a 2-point response for question number 10:

The student shows partial understanding of extracting and explaining mathematical information from a graph by identifying the time period "*then for about 3 – 4 days*" and identifying that the change in population remains constant "*began to balance out*" for the **No Growth** phase; and identifying the time period "*day 17*" and indicating that the time period goes beyond day 17 "*all the way to day 22*" and describing the change in population "*downfall*" for the **Decline** phase. Although the student identifies the time period "*to day 10*" for the **Initial Growth** phase, the description of the change in population "*grew at a steady pace*" is not acceptable because "*steady*" is not qualified with a population count; and although a description of the change in population "*sky-rocketed*" is given for the **Rapid Growth** phase, the time period is incorrect. This response earns two points.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

Additional work space

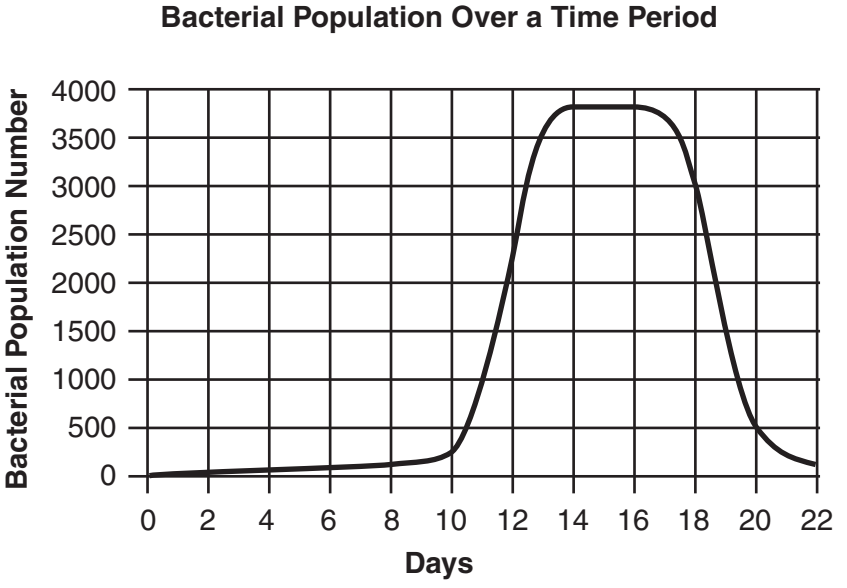
Bacterial population over a Time period

Day	Population
2	0
4	50
6	100
8	150
10	250
12	2250
14	3500
16	3800
18	3000
20	500
22	200

Annotated example for a 1-point response for question number 10:

The student shows partial understanding of extracting and explaining mathematical information from a graph by creating a table that includes at least 5 data points. This response earns one point.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

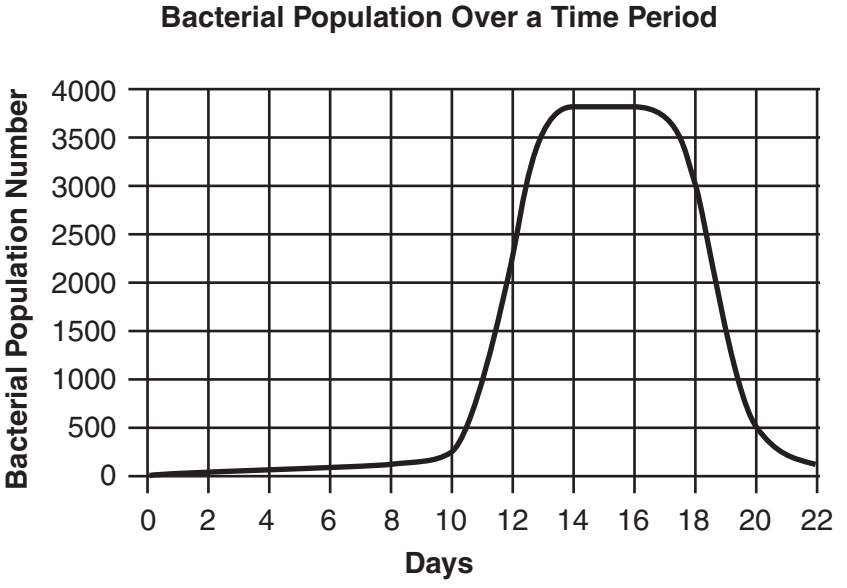
Additional work space

The bacteria grew slowly until day 15 then it grew quickly and dropped on day 20. the bacteria started dying.

Annotated example for a 1-point response for question number 10:

The student shows partial understanding of extracting and explaining mathematical information from a graph by identifying the time period "*until day 10*" and describing the change in population "*grew slowly*" for the **Initial Growth** phase. No information is given for the **Rapid Growth** phase, **No Growth** phase or **Decline** phase. This response earns one point.

10 Maria is observing bacterial growth in a science fair project. She put the bacteria in a petri dish and counted the number of bacteria. She then graphed the counts and drew a line to show the growth curve. The graph shows the population of the bacteria.



Use the information from the graph and describe what happened to the bacteria over the entire time period.

Be sure to include:

- at least four population changes shown in the graph
- when each population change happened.

It looks like it started slowly and then it increased more and more until it almost hit 400 and then it went back down.

Additional work space

Annotated example for a 0-point response for question number 10:

The student shows little or no understanding of extracting and explaining mathematical information from a graph by only describing the change in population for the **Initial Growth** phase "*started slowly,*" the **Rapid Growth** phase "*increased more and more,*" and the Decline phase "*whent back down.*" The lack of the description of the change in population for the **No Growth** phase prevents this response from earning one point. This response earns zero points.