



***New York State
Testing Program***

**2018
Mathematics Test**

Grade 6

Scoring Leader Materials

Training Set

Grade 6 Mathematics Reference Sheet

CONVERSIONS

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

FORMULAS

Triangle

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

Right Rectangular Prism

$$V = Bh \text{ or } V = lwh$$

2-Point Holistic Rubric

2 Point	<p>A two-point response includes the correct solution to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none">• indicates that the student has completed the task correctly, using mathematically sound procedures• contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures• may contain inconsequential errors that do not detract from the correct solution and the demonstration of a thorough understanding
1 Point	<p>A one-point response demonstrates only a partial understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none">• correctly addresses only some elements of the task• may contain an incorrect solution but applies a mathematically appropriate process• may contain the correct solution but required work is incomplete
0 Point*	<p>A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.</p>

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

3-Point Holistic Rubric

3 Point	<p>A three-point response includes the correct solution(s) to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none"> • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution(s) and the demonstration of a thorough understanding
2 Point	<p>A two-point response demonstrates a partial understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none"> • appropriately addresses most but not all aspects of the task using mathematically sound procedures • may contain an incorrect solution but provides sound procedures, reasoning, and/or explanations • may reflect some minor misunderstanding of the underlying mathematical concepts and/or procedures
1 Point	<p>A one-point response demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none"> • may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete • exhibits multiple flaws related to misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning • reflects a lack of essential understanding of the underlying mathematical concepts • may contain the correct solution(s) but required work is limited
0 Point*	<p>A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.</p>

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

2018 2- and 3-Point Mathematics Scoring Policies

Below are the policies to be followed while scoring the mathematics tests for all grades:

1. If a student shows the work in other than a designated “Show your work” or “Explain” area, that work should still be scored.
2. If the question requires students to show their work, and the student shows appropriate work and clearly identifies a correct answer but fails to write that answer in the answer space, the student should still receive full credit.
3. If students are directed to show work, a correct answer with **no** work shown receives **no** credit.
4. If students are **not** directed to show work, any work shown will **not** be scored. This applies to items that do **not** ask for any work and items that ask for work for one part and do **not** ask for work in another part.
5. If the student provides one legible response (and one response only), the rater should score the response, even if it has been crossed out.
6. If the student has written more than one response but has crossed some out, the rater should score only the response that has **not** been crossed out.
7. If the student provides more than one response, but does not indicate which response is to be considered the correct response and none has been crossed out, the student shall not receive full credit.
8. If the student makes a conceptual error (that is an error in understanding rather than an arithmetic or computational error), that student shall not receive more than 50% credit.
9. Trial-and-error responses are **not** subject to Scoring Policy #6 above, since crossing out is part of the trial-and-error process.
10. If a response shows repeated occurrences of the same conceptual error within a question, the conceptual error should **not** be considered more than once in gauging the demonstrated level of understanding.
11. In questions requiring number sentences, the number sentences must be written horizontally.
12. When measuring angles with a protractor, there is a +/- 5 degrees deviation allowed of the true measure.
13. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question but that work results in a score of zero.

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

Answer _____ work stations

EXEMPLARY RESPONSE

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} \div \frac{1}{16} = \frac{7}{8} \times 16 = 7 \times 2 = 14 \text{ work stations in two rooms}$$

$$14 \div 2 = 7 \text{ work stations per room}$$

Or other valid process

Answer 7 work stations

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} \div 2$$

$$= \frac{7}{8} \times \frac{1}{2} = \frac{7}{16}$$

$$\frac{7}{16} \div \frac{1}{16} = \frac{7}{1} = 7$$

Answer 7 work stations

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The amount of clay and the number of work stations per classroom are correctly determined using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 2

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} \div \frac{1}{16} = 14$$

(Handwritten work showing the division of fractions and the result 14.)

$$\frac{7}{8} \times \frac{16}{1} = \frac{112}{8}$$

(Handwritten work showing the conversion of division to multiplication.)

$$\frac{112}{8} = 14$$

(Handwritten long division showing 8 goes into 112 exactly 14 times.)

$$14 \div 2 = 7 \text{ Stations per classroom}$$

Answer 7 work stations

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of work stations per classroom is correctly determined using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 3

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} = \frac{14}{16}$$
$$14 \div 2 = 7$$

Answer

7

work stations

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of work stations per classroom is correctly determined using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 4

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} \times \frac{16}{1} = \frac{112}{8} = 14 \div 2 = 8$$

Answer work stations

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The total number of work stations is correctly determined; however, a calculation error is made when solving for the number of work stations in each classroom. The response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 5

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\begin{array}{r} 4 \\ 16 \\ \times 7 \\ \hline 112 \end{array}$$
$$\frac{7}{8} \div \frac{1}{16}$$
$$\frac{7}{8} \times \frac{16}{1} = \frac{112}{8}$$
$$\begin{array}{r} 14 \\ 8 \overline{)112} \\ \underline{-8} \\ 32 \\ \underline{-32} \\ 0 \end{array}$$

Answer 14 work stations

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The total number of work stations is correctly calculated; however, the result is not divided between two rooms. The response correctly addresses only some elements of the task.

GUIDE PAPER 6

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} \div \frac{1}{16} = \frac{112}{8} = 14$$
$$14 \times 2 = 28$$

Answer work stations

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The total number of work stations is correctly calculated; however, a conceptual error is made when determining the number of work stations in each classroom. The response correctly addresses only some elements of the task.

GUIDE PAPER 7

39

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} \times \frac{1}{16} = \frac{7}{128} \div 2 = \frac{3}{64}$$

Answer

$\frac{3}{64}$

work stations

Score Point 0 (out of 2 points)

Although the work contains some correct elements, holistically the response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect procedure is used to determine the total number of stations, and the division is carried out incorrectly.

An art teacher has a total of $\frac{7}{8}$ pound of clay. The teacher puts $\frac{1}{16}$ pound of clay at each work station. The teacher sets up an equal number of work stations in each of 2 classrooms. How many work stations does the teacher set up in each of the classrooms?

Show your work.

$$\frac{7}{8} \times \frac{1}{16} = \frac{7}{128} \quad 2 \frac{1}{128}$$

$$\begin{array}{r} 4 \\ 8 \\ \times 16 \\ \hline 128 \end{array}$$

$$\begin{array}{r} 1 \\ 128 \\ \times 2 \\ \hline 256 \end{array}$$

$$\frac{1}{256}$$

Answer 6 work stations

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The answer and work are incorrect and show no overall understanding.

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression _____

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

Answer Total cost \$ _____

EXEMPLARY RESPONSE

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression _____

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

$$16n + 2.5 \quad \text{Or other valid expression}$$

$$n = 4$$

$$16 \times 4 + 2.5 = 64 + 2.5 = 66.5 \text{ dollars}$$

Or other valid process

Answer Total cost \$ 66.5

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression (\$16.00n + 2.50)

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

(\$16.00n + 2.50)
\$16.00 times 4 is \$64.00 + 2.50 = \$66.50

Answer Total cost \$

66.50

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct expression is written and is correctly solved for the total cost using mathematically sound procedures.

GUIDE PAPER 2

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression $(16xp)+2.50$

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

$p = \text{people}$ $(16xp) + 2.50 = n$
 $(16 \times 4) + 2.50 = n$
 $64 + 2.50 = n$
 $\$66.50 = \66.50

Answer Total cost \$

66.50

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct expression is written in terms of p , with variable p defined in the work. The expression is correctly solved for the cost of 4 tickets. The work contains an inconsequential error of using variable n to indicate the total cost that does not detract from the correct solution and the demonstration of a thorough understanding.

GUIDE PAPER 3

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression $n16+2.50$

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

$64+2.50$
 $n=4$

Answer Total cost \$

66.50

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct expression is written and is correctly solved for the total cost using mathematically sound procedures.

GUIDE PAPER 4

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression $n = 16x + 2.5$

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

$n = 16 + 2.5$
 $n = 16 \times 4 + 2.5$
 $n = 64 + 2.5$
 $n = 66.5$

Answer Total cost \$

66.50

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. An equation instead of an expression is written in terms of x , with the variable n incorrectly used. The cost of 4 tickets is correctly determined. The response correctly addresses only some elements of the task.

GUIDE PAPER 5

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression $16.00+16.00+16.00+16.00+2.50$

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

16.00
16.00
16.00
 $16.00=66.5+2.50=69$

Answer Total cost \$

69

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. Although the expression is correct for four tickets, it is not written in terms of n . A calculation error is made when solving for the total cost resulting in an incorrect solution. The response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 6

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

Answer Total cost \$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. An incorrect expression is written. The total cost is correctly determined; however, n instead of 2.5 is shown in the work. The response correctly addresses only some elements of the task.

GUIDE PAPER 7

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression $(16x3)+(2.50x3)$

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

$$\begin{aligned} 16x3 &= 48 \\ 2.50x3 &= 7.50 \\ 48 + 7.50 &= 55.5 \end{aligned}$$

Answer Total cost \$ $\boxed{\$55.5}$

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The expression is incorrect and the total cost of only 3 tickets is determined with the service fee inappropriately multiplied by 3.

40

Tom wants to order tickets online so that he and three of his friends can go together to a water park. The cost of the tickets is \$16.00 per person. There is also a \$2.50 one-time service fee for ordering tickets online. Write an expression in terms of n that represents the cost for ordering n tickets online.

Expression $16+2.50n$

Use your expression to find the total cost for ordering 4 tickets online.

Show your work.

$$16.00+2.50=18.5$$

Answer Total cost \$

18.50

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The expression is incorrect and the cost of only one ticket is calculated and provided as the solution.

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

Answer _____ red drops; _____ blue drops

EXEMPLARY RESPONSE

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

8 pints in a gallon

$$8 \times 50 = 400 \text{ pints}$$

$$3 \times 400 = 1200 \text{ red drops}$$

$$2 \times 400 = 800 \text{ blue drops}$$

Or other valid process

OR $3 \times 8 = 24$ red drops in one gallon

$$2 \times 8 = 16 \text{ blue drops in one gallon}$$

$$24 \times 50 = 1200 \text{ red drops}$$

$$16 \times 50 = 800 \text{ blue drops}$$

Answer 1200 red drops; 800 blue drops

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

1 gallon = 8 pints

$$\begin{array}{r} 3^r + 2^b \\ \hline 1 \text{ pint} \end{array} \times 8 \text{ pints} = \frac{24^r + 16^b}{8 \text{ pints}}$$

$$\begin{array}{l} 3 \times 8 = 24 \\ 2 \times 8 = 16 \end{array}$$

24^{red} and 16^{blue}
for ONE gallon
x 50 to get to 50 gallons

$$\begin{array}{l} 24 \times 50 = 1200 \\ 16 \times 50 = 800 \end{array}$$

1,200 red
800 blue for 50 gallons

Answer 1,200 red drops; 800 blue drops

Score Point 2 (out of 2 points)

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

GUIDE PAPER 2

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

$$\begin{array}{r} 3 \\ .8 \\ \hline 24 \\ .50 \\ \hline 1200 \end{array}$$

$$2 \times 4 = 8$$

$$\begin{array}{r} 2 \\ .8 \\ \hline 16 \\ .50 \\ \hline 800 \end{array}$$

Answer

1200

red drops;

800

blue drops

Score Point 2 (out of 2 points)

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

GUIDE PAPER 3

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

$$\begin{array}{r} 50 \\ \times 8 \\ \hline 400 \end{array}$$

$$\begin{array}{r} 400 \\ \times 3 \\ \hline 1200 \end{array}$$

$$\begin{array}{r} 400 \\ \times 2 \\ \hline 800 \end{array}$$

Answer 1,200 red drops; 800 blue drops

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The total number of pints and the number of red and blue drops is correctly determined using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 4

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

$$8 \text{ pints} = 1 \text{ gallon}$$

$$24 \text{ red} = 16 \text{ blue}$$

$$\begin{array}{r} 50 \\ \times 24 \\ \hline 200 \\ 1000 \\ \hline 1200 \end{array}$$

$$\begin{array}{r} 316 \\ \times 50 \\ \hline 00 \\ 500 \\ \hline 500 \end{array}$$

Answer 1200 red drops; 500 blue drops

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of red and blue drops in one gallon is correctly calculated; however, a calculation error is made when determining the total number of blue drops. The response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 5

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

3 red
2 blue
white paint
each pint

1 quart = 2 pints
1 quart = 4 quarts
gallon
1 gallon = 8 pints
50 gallons = 400 pints

$$\begin{aligned} 3 \times 8 &= 3 \times 400 = 3 \times 200 \\ 2 \times 8 &= 2 \times 400 = 2 \times 200 \end{aligned}$$

Answer 600 red drops; 400 blue drops

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of pints is correctly calculated. A conceptual error is made when solving for the number of red and blue drops. The response correctly addresses only some elements of the task.

GUIDE PAPER 6

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

$$3 \times 2 = 6$$

1 pint > 1 quart

2 pint

3 pint > 2 quarts

4 pint

5 pint > 3 quarts

6 pint

7 pint > 4 quarts

8 pint

1 gallon

$$8 \times 3 = 24$$

$$8 \times 2 = 16$$

Answer 24 red drops; 16 blue drops

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of red and blue drops in one gallon is correctly calculated and provided as the solution. The number of red and blue drops in 50 gallons is not addressed. The response correctly addresses only some elements of the task.

GUIDE PAPER 7

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

$$\begin{array}{l} 3 = \text{red} \\ 2 = \text{blue} \\ \text{purple} = 1 \\ 3 + 2 = \text{purple paint} \\ \\ \text{red} = 150 \\ \text{blue} = 100 \\ \text{purple paint} = 50 \end{array}$$
$$\begin{array}{r} 3 \\ \times 50 \\ \hline 150 \end{array}$$
$$\begin{array}{r} 50 \\ \times 2 \\ \hline 100 \end{array}$$

Answer 150 red drops; 100 blue drops

Score Point 0 (out of 2 points)

Although the response contains some correct elements, holistically the work is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Numbers from the prompt are multiplied and the result is provided as the solution.

41

A factory adds three red drops and two blue drops of coloring to white paint to make each pint of purple paint. The factory will make 50 gallons of this purple paint. How many drops of red and blue coloring will the factory need in the 50-gallon batch of purple paint?

Show your work.

$$\begin{array}{r} 3+2 \\ 3 = \text{red red red} \\ + 2 = \text{blue blue} \\ \hline 5 \end{array}$$

$$50 \div 3 = 16.66$$

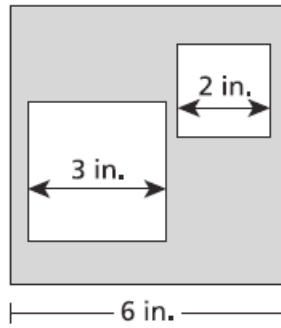
$$50 \div 2 = 25$$

Answer 16.66 red drops; 25 blue drops

Score Point 0 (out of 2 points)

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

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

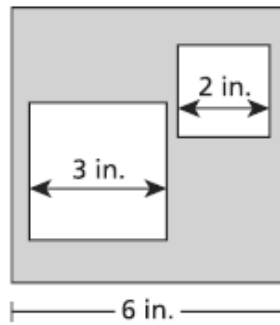
Show your work.

Answer _____ square inches

EXEMPLARY RESPONSE

42

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

Show your work.

$$6^2 - (3^2 + 2^2) \text{ Or other valid expression}$$

$$36 - (9 + 4) = 36 - 13 = 23 \text{ square inches}$$

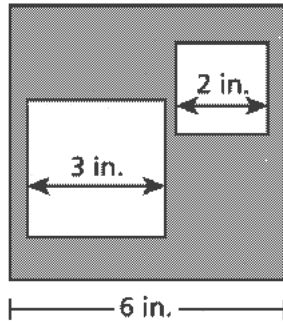
Or other valid process

Answer _____ square inches

GUIDE PAPER 2

42

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

Show your work.

$$\begin{aligned} & (6^2) - (3^2 + 2^2) \\ & 36 - (9 + 4) \\ & 36 - (13) \\ & 23 \end{aligned}$$

Answer

23

square inches

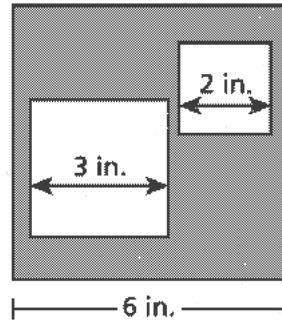
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct expression is written and is correctly solved for the shaded area using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 3

42

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

Show your work.

$$6^2 - [(3^2) + (2^2)]$$
$$36 - (9 + 4)$$
$$36 - 13 = 23 \text{ in}^2$$

Answer

23

square inches

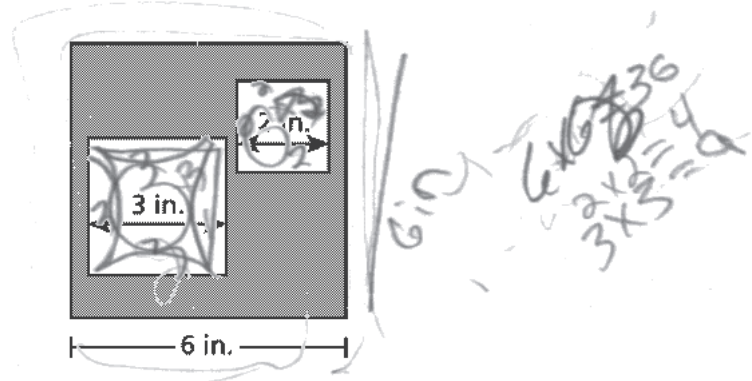
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct expression is written and is correctly solved for the shaded area using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 4

42

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

Show your work.

$$\begin{aligned}
 &6^2 - 3^2 - 2^2 \\
 &= 36 - 9 - 4 \\
 &= 36 - 13 \\
 &= 23 \text{ in}^2
 \end{aligned}$$

Answer

23

square inches

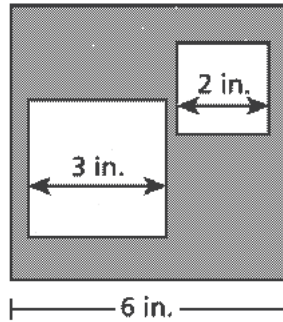
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The shaded area is correctly calculated; however, the expression is missing the parentheses and is incorrect. The response correctly addresses only some elements of the task.

GUIDE PAPER 6

42

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

Show your work.

$$\begin{aligned} 6^2 - (3^2 + 2^2) &= \\ 36 - (9 + 4) &= \\ 36 - 15 &= 21 \end{aligned}$$

Answer

21

square inches

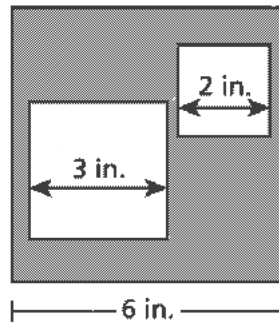
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. A correct expression is written; however, a calculation error is made when determining the shaded area. The response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 7

42

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

Show your work.

31

$$6 \times 6 = 36 - 5 = 31$$

Answer

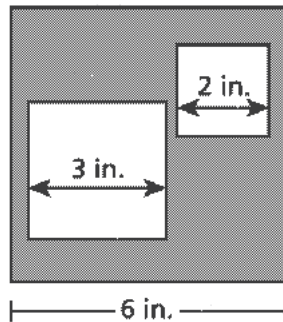
31

square inches

Score Point 0 (out of 2 points)

Although the response correctly calculates the area of the largest square, holistically the work is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The sum of two sides is subtracted from the area of the largest square.

The diagram below shows a large square with two smaller squares within it.



Write an expression, involving exponents, to represent the shaded area, in square inches, of the diagram. Then use that expression to calculate the shaded area, in square inches, of the diagram.

Show your work.

$$A = l \cdot w \cdot h$$

$$A = 3 \cdot 6 \cdot 2$$

$$A = 18 \cdot 2$$

$$A = 36$$

[Faint handwritten notes and calculations are visible in the background.]

Answer

36

square inches

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect procedure is used to determine the shaded area.

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' (_____ , _____)

Explain how you determined your answer.

EXEMPLARY RESPONSE

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' (_____ , _____)

Explain how you determined your answer.

When $(-2, 3)$ is reflected over the x -axis the sign of the y -coordinate changes from 3 to -3 to create point W' $(-2, -3)$.

When $(-2, -3)$ is reflected over the y -axis the sign of the x -coordinate changes from -2 to 2 to create point $W''(2, -3)$.

Or other valid explanation

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' $(2, -3)$

Explain how you determined your answer.

I determined my answer because reflecting over the x -axis means I turn the y -coordinate to its opposite. And reflecting over the y -axis means I turn the x -coordinate to its opposite.

$$W = (-2, 3)$$

$$W' = (-2, -3)$$

$$W'' = (2, -3)$$

↓
Answer

(x, y)

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The answer and explanation are correct.

GUIDE PAPER 2

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' (,)

Explain how you determined your answer.

If point W is at $(-2, 3)$
You reflect it onto the x axis and then it becomes point W' $(-2, -3)$
Then you move it over on to the y axis to create point W'' $(2, -3)$

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The answer and explanation are correct. The explanation contains inconsequential errors, “*reflect it onto the x axis*” and “*move it over on to the y axis,*” that do not detract from the correct solution and the demonstration of a thorough understanding.

GUIDE PAPER 3

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' (,)

Explain how you determined your answer.

Over the x axis the 3 would turn to negative three then the negative two would flip causing it to be a normal two

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The answer and explanation are correct.

GUIDE PAPER 4

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W'. Point W' is then reflected over the y -axis to create point W". What ordered pair describes the location of point W"?

Answer Point W" $(2, -3)$

Explain how you determined your answer.

I goes to $(-2, -3)$ the over the Y axis

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct coordinates of point W" are provided; however, the explanation is incomplete. It is not clear to what the phrase "goes to $(-2, -3)$ the over the Y axis" is referring. The response correctly addresses only some elements of the task.

GUIDE PAPER 5

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' $(2, -3)$

Explain how you determined your answer.

I determined that because $-2, 3$ is the x -axis $2, -3$ is the opposite that go on the top where y -axis.

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct coordinates of point W'' are provided; however, it is not clear from the explanation how the location of W'' is obtained. The response correctly addresses only some elements of the task.

GUIDE PAPER 6

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' (,)

Explain how you determined your answer.

I determined my answer by imagining a grid in my head. At the top left quartile, I imagined $(-2, 3)$. Then, to the next quartile I imagined plots $(2, 3)$ because it reflects $(-2, 3)$. After that, at the quartile below there should be plots $(2, -3)$ because it reflects $(2, 3)$. Reflection basically means that it's the same number only that it depends on what quadrant you are in.

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct coordinates of point W'' are provided; however, the order of reflections is reversed in the explanation, resulting in incorrect coordinates of point W' . The response correctly addresses only some elements of the task.

GUIDE PAPER 7

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' (,)

Explain how you determined your answer.

I used the graph paper to do my work and got 3 point W's so i asumed that the awnsner was the only one i didn't get. The points i got were $(2,-3)$, $(-2,3)$, $(-2,-3)$.

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The answer and explanation are incorrect and show no overall understanding.

43

Point W is located at $(-2, 3)$ on a coordinate plane. Point W is reflected over the x -axis to create point W' . Point W' is then reflected over the y -axis to create point W'' . What ordered pair describes the location of point W'' ?

Answer Point W'' $(-2, 3)$

Explain how you determined your answer.

The question just told me to reflect
two times so first time is $(3, -2)$
then the second time is $(-2, 3)$ still the same

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The answer and explanation are incorrect and show no overall understanding.

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

Answer _____ pound(s) per tablespoon

EXEMPLARY RESPONSE

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

$$2 \times 3 = 6 \text{ tablespoons}$$

$$48 \div 6 = 8 \text{ ounces per tablespoon}$$

$$8 \div 16 = 0.5 \text{ pound per tablespoon}$$

Or $48 \div 16 = 3 \text{ pounds}$

$$3 \div 6 = 0.5 \text{ pound per tablespoon}$$

Or other valid process

Answer _____ pound(s) per tablespoon

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

$$48:2 \quad 2 \times 3 = 6$$

$$48:6$$

oz	48	8	= 6
Tbs	6	1	= 6

8oz per 1Tbs

oz	8	16	x2
Tbs	0.5	1	x2

Answer 0.5 pound(s) per tablespoon

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The ratio of ground beef to chili powder in the second pot is correctly determined using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 2

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

$$\begin{array}{r} 80z \\ 6 \overline{) 480z} \end{array}$$

$$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$$

~~$$\begin{array}{r} 11bs \\ \hline 16 \end{array}$$~~

$$\frac{1}{2}$$

$$1 \text{ lbs} = 16 \text{ oz}$$

$$\begin{array}{r} 2 \\ 8 \overline{) 16} \end{array}$$

Answer $\frac{1}{2}$ pound(s) per tablespoon

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The ratio of ground beef to chili powder in the second pot is correctly determined using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 3

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

$$\begin{array}{r} 2 \text{ tbls} \\ \times 3 \text{ tbl} \\ \hline 6 \text{ tbl} \end{array}$$

~~$$\begin{array}{r} 48 \text{ oz ground beef} \\ \div 6 \text{ tbl} \\ \hline 8 \text{ oz per table spoon} \end{array}$$~~
$$\begin{array}{r} 48 \text{ oz} \\ \div 16 \\ \hline 3 \text{ lbs} \end{array}$$

$$\begin{array}{r} .5 \\ 6 \overline{) 3} \end{array}$$

Answer .5 pound(s) per tablespoon

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The ratio of ground beef to chili powder in the second pot is correctly determined using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 4

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

First chili:

48 ounces ground beef

2 tablespoons chili powder

Second chili:

48 ounces of ground beef

6 table spoons of powder

$$\begin{array}{r} 8 \\ 6 \overline{)48} \\ \underline{-48} \\ 0 \end{array}$$

Answer 8 pound(s) per tablespoon

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The amount of ground beef in ounces per tablespoon of chili powder is correctly determined; however, the result is not converted to pounds. The response correctly addresses only some elements of the task.

GUIDE PAPER 5

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

$$\begin{array}{r} 3 \text{ pounds of ground beef} \\ 16 \overline{) 48} \\ \underline{- 48} \\ 0 \end{array}$$

$$\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array} \text{ tablespoon of chili powder}$$

He use 3 pounds of ground beef per 6 tablespoons of chili powder.

Answer 3 pound(s) per tablespoon

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The amount of ground beef is correctly converted to pounds and the result is provided as the solution. The ratio of meat to chili powder is not calculated. The response correctly addresses only some elements of the task.

GUIDE PAPER 6

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

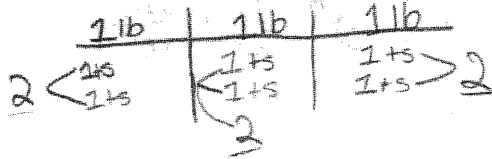
Show your work.

1 st pot	2 nd pot
48oz beef	48oz beef
2ts powder	6ts powder
	— lbs per TS

$2 \times 3 = 6$

$1lb = 16oz$

$48oz = 3lbs$
6TS



$2 \times 3 = 6$

Answer 1.52 pound(s) per tablespoon

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The amount of ground beef is correctly converted to pounds. The reciprocal ratio of chili powder to meat is calculated and provided as the solution. The response correctly addresses only some elements of the task.

GUIDE PAPER 7

44

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

$$\begin{array}{r} 48 \\ \hline 2 \times 3 = 6 \text{ tsp} \end{array} \quad \begin{array}{r} 480 \\ \hline 6 \text{ tsp} \end{array} \quad \begin{array}{r} 16 \\ \hline +16 \\ +16 \\ \hline 48 \end{array}$$

Answer 16 pound(s) per tablespoon

Score Point 0 (out of 2 points)

Although the response contains some correct elements, holistically the work is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The quantity of beef is split into three groups of 16 and an incorrect answer is provided as the solution.

Jaden made a pot of chili with 48 ounces of ground beef and 2 tablespoons of chili powder. He made another pot of chili with the same amount of ground beef, but he used 3 times as much chili powder. How many pounds of ground beef per tablespoon of chili powder did he use in the second pot of chili?

Show your work.

$$\frac{2}{48} = \frac{x}{3}$$
$$\frac{48x}{48} = \frac{6}{48}$$
$$x = 8$$

Answer 8 pound(s) per tablespoon

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect proportion is solved incorrectly to determine a solution.

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

Answer _____ cubic feet

EXEMPLARY RESPONSE

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

Edge length: $2\frac{1}{2} \times \frac{1}{5} = \frac{5}{2} \times \frac{1}{5} = \frac{5}{10} = \frac{1}{2}$ feet

Volume: $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8} = 0.125$ cubic feet

Or other valid process

Answer _____ cubic feet

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

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

$$\frac{5}{10} \times \frac{5}{10} = \frac{25}{100} \times \frac{5}{10} = \frac{125}{1000}$$

$$\begin{array}{r} 25 \\ \times 5 \\ \hline 125 \end{array} \quad \frac{125}{1000} \times \frac{5}{10} = \frac{250}{1000} \times \frac{5}{10} = \frac{500}{1000}$$

Answer $\frac{125}{1000}$ cubic feet

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The edge length and the volume of the block are correctly calculated using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 2

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

$$\begin{aligned}\frac{1}{5} \times 2\frac{1}{2} &= \frac{1}{2} \\ v &= lwh \\ v &= \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \\ v &= \frac{1}{8} \text{ cubic feet}\end{aligned}$$

Answer

$$v = \frac{1}{8}$$

cubic feet

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The edge length and the volume of the block are correctly calculated using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 3

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

$$2\frac{1}{2} \times \frac{1}{5} = \frac{1}{2} \qquad \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$$

Answer

$$\frac{1}{8}$$

cubic feet

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The edge length and the volume of the block are correctly calculated using mathematically sound procedures. The response is complete and correct.

GUIDE PAPER 4

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

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

$$\begin{aligned} V &= LWH \\ V &= \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \\ V &= 1\frac{1}{2} \end{aligned}$$

Answer 1 $\frac{1}{2}$ cubic feet

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The edge length of the block is correctly determined. A correct procedure is written to solve for the volume; however, an error is made by adding instead of multiplying the dimensions. The response addresses some elements of the task correctly.

GUIDE PAPER 5

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

$$.5 \times .5 \times .5 = .125$$

Answer

.125

cubic feet

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The volume of the block is correctly determined; however, the work does not show how $\frac{1}{2}$ is obtained. The response contains the correct solution but the required work is incomplete.

GUIDE PAPER 6

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

$$.2 \overline{) 2.5}$$

$$\begin{array}{r} 0.5 \\ \times 6 \\ \hline 3 \end{array}$$

Answer 3 cubic feet

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The edge length of the block is correctly calculated; however, an incorrect procedure is used to determine the volume of the block. The response correctly addresses only some elements of the task.

GUIDE PAPER 7

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

$$\begin{aligned} V &= lwh \\ V &= \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} & \frac{1}{5} \cdot \frac{1}{5} &= \frac{1}{10} \\ V &= \frac{1}{50} & \frac{1}{10} \cdot \frac{1}{5} &= \frac{1}{50} \end{aligned}$$
$$\begin{aligned} 2\frac{1}{2} \cdot 2\frac{1}{2} \\ \frac{5}{2} \cdot \frac{5}{2} &= \frac{25}{4} \end{aligned}$$
$$\frac{25}{4} \cdot \frac{5}{2} = \frac{125}{8}$$
$$\begin{array}{r} 2 \\ 25 \\ \times 5 \\ \hline 125 \end{array}$$

Answer $\frac{1}{50}$ cubic feet

Score Point 0 (out of 2 points)

Although the work contains some correct elements, holistically the response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The value $\frac{1}{5}$ is misinterpreted and the work for the volume of the block is incorrect.

45

Cube-shaped blocks are packed into a cube-shaped storage container.

- The edge length of the storage container is $2\frac{1}{2}$ feet.
- The edge length of each block is $\frac{1}{5}$ the edge length of the storage container.

What is the volume, in cubic feet, of one cube-shaped block?

Show your work.

$$\frac{1}{2} \times 6 = 3$$

Answer

3

cubic feet

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The work for calculating $\frac{1}{2}$ is not provided and an incorrect procedure is used to determine the volume.

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

Answer length _____ feet

area _____ square feet

EXEMPLARY RESPONSE

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

$$l = 2w$$

Or

$$w = \frac{1}{2}l$$

$$w + w + 2w + 2w = 36$$

$$l + l + \frac{1}{2}l + \frac{1}{2}l = 36$$

$$6w = 36$$

$$3l = 36$$

$$w = \frac{36}{6} = 6 \text{ feet}$$

$$l = \frac{36}{3} = 12 \text{ feet}$$

$$l = 2 \times 6 = 12 \text{ feet}$$

$$w = \frac{1}{2} \times 12 = 6 \text{ feet}$$

$$\text{Length} = 12 \text{ feet}$$

$$\text{Area} = 6 \times 12 = 72 \text{ square feet}$$

Or other valid process

Answer length _____ feet

area _____ square feet

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

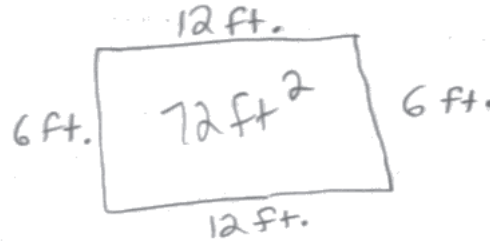
$$P = l + l + w + w$$

$$\boxed{36 = 2w + 2w + w + w}$$

$$36 = 4w + 2w$$

$$36 = 6w$$

$$\text{width} = 6 \text{ ft}$$



$$6 + 6 = 12$$

$$\begin{array}{r} 36 \\ -12 \\ \hline 24 \end{array}$$

$$24 \div 2 = 12$$

$$P = 12 + 12 + 6 + 6$$

$$P = 36 \text{ feet}$$

$$A = l \times w$$

$$= 12 \times 6$$

$$= 72 \text{ ft}^2$$

Answer length: 12 feet

area: 72 square feet

Score Point 3 (out of 3 points)

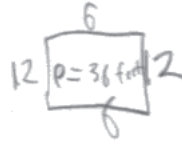
This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct equation is written and is correctly solved to determine the length and the area of the mat. The response is complete and correct.

GUIDE PAPER 2

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.



$$\begin{array}{r} 1 \\ \times 12 \\ 6 \\ \hline 12 \end{array}$$

$$36 \text{ feet} = (w \times 2) + (w \times 4)$$

$$36 \text{ ft} = (6 \times 2) + 6 \times 4$$

$$36 \text{ ft} = 12 + 24$$

$$36 \text{ ft} = 36 \quad \begin{array}{r} 12 \\ 2 \overline{) 24} \end{array}$$

Answer length: 12 feet

area: 72 square feet

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct equation is written and is correctly solved to determine the length and the area of the mat. The response is complete and correct.

GUIDE PAPER 3

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

$$2x + x + 2x + x = 36$$

$$\frac{6x}{6} = \frac{36}{6}$$
$$x = 6$$

$$12 \cdot 6 = 72 \text{ ft}^2$$

Answer length: 12 feet

area: 72 square feet

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A correct equation is written and is correctly solved for the width and length. The area of the mat is correctly determined. The response contains sufficient work to demonstrate a thorough understanding.

GUIDE PAPER 4

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

$$\begin{array}{c} s(2) + w(2) \\ \downarrow \quad \downarrow \end{array}$$

$$\begin{array}{c} 12(2) + 6(2) \\ \downarrow \quad \downarrow \end{array}$$

$$\begin{array}{c} 24 + 12 \\ \downarrow \\ 36 \end{array}$$

Perimeter	length	width
6	2	1
24	8	4
36	12	6

Area
$S \times W$
12×6
\downarrow
72

$s = \text{length}$
$w = \text{width}$

Answer length: 12 feet

area: 72 square feet

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. The length and the area of the mat are correctly determined using sound procedures; however, an expression instead of an equation is written. The response appropriately addresses most, but not all aspects of the task.

GUIDE PAPER 5

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

$$\begin{aligned} (P \div 6) \times 2 &= L & 36 \div 6 &= 6 \times 2 = 12 = L \\ (P \div 6) &= W & 36 \div 6 &= 6 = W \end{aligned}$$

Answer length: 12 feet
area: 6 square feet

Score Point 2 (out of 3 points)

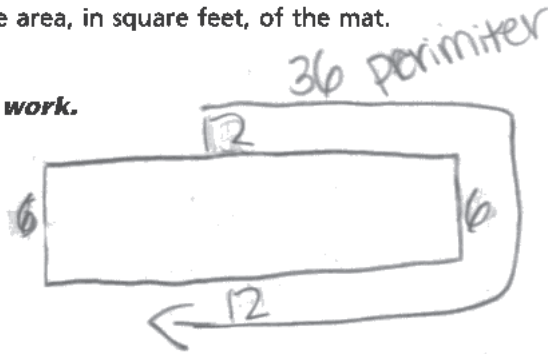
This response demonstrates a partial understanding of the mathematical concepts in the task. A correct equation is written and is correctly solved to determine the length and width of the mat; however, the area is not calculated. The response appropriately addresses most, but not all aspects of the task using mathematically sound procedures.

GUIDE PAPER 6

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.



$$36 - 12 = 24$$

Arrows point from 24 to two '6's. Below the '6's is the word 'Half' and the symbol $\frac{1}{2}$.

$$12 \times 6 = 72$$

Answer length: 12 feet

area: 72 square feet

Score Point 2 (out of 3 points)

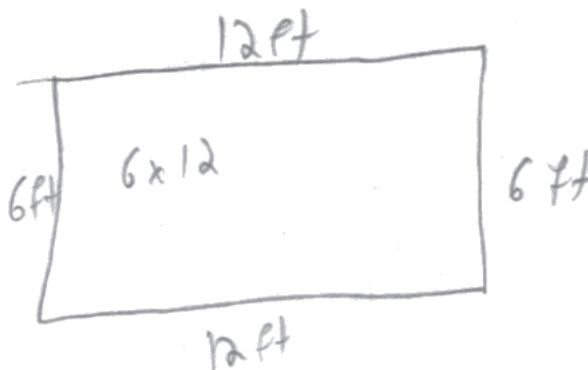
This response demonstrates a partial understanding of the mathematical concepts in the task. The length and the area of the mat are correctly calculated; however, it is not clear from the written equation how the length is determined. The response appropriately addresses most, but not all aspects of the task.

GUIDE PAPER 7

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.



Answer length: 12 feet

area: 72 square feet

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The length and the area of the mat are correctly calculated; however, no equation is written and the work is limited in showing how the answers are obtained. The response contains the correct solutions but the required work is limited.

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

$$\begin{array}{r} 12 \times 2 = 24 \\ + \\ 6 \times 2 = 12 \\ \hline 36 \text{ feet} \end{array}$$

$$12 \times 6 = 72$$

Answer length: 24 feet

area: 72 square feet

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The area of the mat is correctly calculated. Although one of the written equations correctly calculates the length, an incorrect answer for the length is provided and it is not clear from the work how the length is determined. The response addresses some elements of the task correctly but reaches an inadequate solution and provides reasoning that is faulty and incomplete.

GUIDE PAPER 9

46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

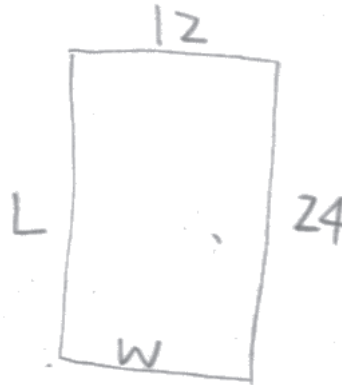
Show your work.

$$W = 12$$
$$L = 24$$

$$W \times 2 = L = 36$$

$$36 \div 3 = 12$$

$$\begin{array}{r} \times 2 \\ \hline 24 \\ + 12 \\ \hline 36 \end{array}$$



$$\begin{array}{r} 12 \\ \times 24 \\ \hline 288 \end{array}$$

Answer length: 24 feet

area: 288 square feet

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. A correct equation is written to solve for the length. A conceptual error is made when determining the width of the mat: the length is calculated but is misinterpreted as the width ($36 \div 3 = 12$). The result is correctly used to calculate the length and the area of the mat. The response reflects a lack of essential understanding of the underlying mathematical concepts.

GUIDE PAPER 10

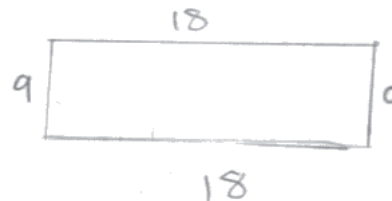
46

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

$$a = lw$$

$$P = 2S + 2S$$



$$\begin{aligned} a &= lw \\ a &= 18 \cdot 9 \\ a &= 162 \text{ ft.}^2 \end{aligned}$$

$$\begin{aligned} P &= 2S + 2S \\ P &= 36 \div 4 = 9 \\ P &= 9 \times 2 = 18 \\ P &= 18 + 9 + 18 + 9 \\ P &= 54 \text{ ft.} \end{aligned}$$

Answer length: 18 feet

area: 162 square feet

Score Point 0 (out of 3 points)

Although the response contains some correct elements, holistically the work is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The equation to determine the length is not written and the work for the perimeter shows no overall understanding.

A rectangular exercise mat has a perimeter of 36 feet. The length of the mat is twice the width. Write and solve an equation to determine the length, in feet, of the mat. Then find the area, in square feet, of the mat.

Show your work.

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$
 36 of the perimeter
 of 36 feet.

Answer length: 6 feet

area: 6 square feet

Score Point 0 (out of 3 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The answers are incorrect and the work is irrelevant to the task.

