New York State Testing Program

2017 Common Core Mathematics Test

Grade 6

Scoring Leader Materials

Training Set
# Grade 6 Mathematics Reference Sheet

## Conversions

<table>
<thead>
<tr>
<th>Unit</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 inch</td>
<td>2.54 centimeters</td>
</tr>
<tr>
<td>1 meter</td>
<td>39.37 inches</td>
</tr>
<tr>
<td>1 mile</td>
<td>5,280 feet</td>
</tr>
<tr>
<td>1 mile</td>
<td>1,760 yards</td>
</tr>
<tr>
<td>1 mile</td>
<td>1.609 kilometers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kilometer</td>
<td>0.62 mile</td>
</tr>
<tr>
<td>1 pound</td>
<td>16 ounces</td>
</tr>
<tr>
<td>1 pound</td>
<td>0.454 kilogram</td>
</tr>
<tr>
<td>1 kilogram</td>
<td>2.2 pounds</td>
</tr>
<tr>
<td>1 ton</td>
<td>2,000 pounds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup</td>
<td>8 fluid ounces</td>
</tr>
<tr>
<td>1 pint</td>
<td>2 cups</td>
</tr>
<tr>
<td>1 quart</td>
<td>2 pints</td>
</tr>
<tr>
<td>1 gallon</td>
<td>4 quarts</td>
</tr>
<tr>
<td>1 liter</td>
<td>3.785 liters</td>
</tr>
<tr>
<td>1 liter</td>
<td>0.264 gallon</td>
</tr>
<tr>
<td>1 liter</td>
<td>1,000 cubic centimeters</td>
</tr>
</tbody>
</table>

## Formulas

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangle</td>
<td>( A = \frac{1}{2}bh )</td>
</tr>
<tr>
<td>Right Rectangular Prism</td>
<td>( V = Bh \text{ or } V = lwh )</td>
</tr>
</tbody>
</table>
# 2-Point Holistic Rubric

| 2 Point | A two-point response includes the correct solution to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response:

- indicates that the student has completed the task correctly, using mathematically sound procedures
- contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures
- may contain inconsequential errors that do not detract from the correct solution and the demonstration of a thorough understanding |

| 1 Point | A one-point response demonstrates only a partial understanding of the mathematical concepts and/or procedures in the task. This response:

- correctly addresses only some elements of the task
- may contain an incorrect solution but applies a mathematically appropriate process
- may contain the correct solution but required work is incomplete |

| 0 Point* | A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task. |

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

#### Score Points:

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| **3 Point** | A three-point response includes the correct solution(s) to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task.  
This response  
  - indicates that the student has completed the task correctly, using mathematically sound procedures  
  - contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures  
  - may contain inconsequential errors that do not detract from the correct solution(s) and the demonstration of a thorough understanding |
| **2 Point** | A two-point response demonstrates a partial understanding of the mathematical concepts and/or procedures in the task.  
This response  
  - appropriately addresses most, but not all aspects of the task using mathematically sound procedures  
  - may contain an incorrect solution but provides sound procedures, reasoning, and/or explanations  
  - may reflect some minor misunderstanding of the underlying mathematical concepts and/or procedures |
| **1 Point** | A one-point response demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task.  
This response  
  - may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete  
  - exhibits multiple flaws related to misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning  
  - reflects a lack of essential understanding of the underlying mathematical concepts  
  - may contain the correct solution(s) but required work is limited |
| **0 Point** | A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.  
*Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).* |
2017 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 blank, 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. Trial-and-error responses are not subject to Scoring Policy #6 above, since crossing out is part of the trial-and-error process.

8. 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.

9. In questions requiring number sentences, the number sentences must be written horizontally.

10. 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.
Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

*Show your work.*

*Answer*
EXEMPLARY RESPONSE

Dana and Monique are dog groomers. Dana's workday is 10 hours and Monique's workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

Show your work.

Dana:
4 days/week
15 \times 4 = 60

Monique:
5 days/week
10 \times 5 = 50

60 - 50 = 10
10 \times 12.75 = 127.50
The difference is $127.50

Or other valid process

Answer

$127.50
Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

**Show your work.**

Dana: $765 a week
40 ÷ 10 = 4 days a week
$12.75 × 15 dogs = $191.25 ← one day
$191.25 × 4 days = $765 ← a week

Monique: $637.50 a week
40 ÷ 8 = 5 days a week
$12.75 × 10 dogs = $127.50 ← one day
$127.50 × 5 days = $637.50 ← a week

$765 - $637.50 = $127.50

**Answer**

$127.50

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The weekly earnings of both groomers and the difference between their earnings are correctly determined using mathematically sound procedures.
Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

Show your work.

\[ 15 \times 15 = 60 \times 12.75 = \$765 \]
\[ 10 \times 5 = 50 \times 12.75 = \$637.5 \]

\[ 765.0 \]
\[ 637.5 \]
\[ - \]
\[ 127.5 \]

Answer

Dana will earn $12.75 more than Monique.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The weekly earnings of both groomers and the difference between their earnings are correctly determined using mathematically sound procedures.
GUIDE PAPER 3

Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

Show your work.

Answer

$127.50

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The difference in the number of dogs groomed per week is correctly calculated, and the difference between earnings is correctly determined using mathematically sound procedures.
GUIDE PAPER 4

Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

Show your work.

\[
\begin{array}{c}
15 \\
\times 12.75 \\
\hline \\
6375 \\
+12750 \\
\hline 19125 \\
\end{array}
\]

\[
\begin{array}{c}
12.75(2) \\
\times 10 \\
\hline \\
127.50 \\
\end{array}
\]

\[
\begin{array}{c}
19125 \\
\times 4 \\
\hline \\
76500 \\
\end{array}
\]

\[
\begin{array}{c}
127.50 \\
\times 5 \\
\hline \\
687.50 \\
\end{array}
\]

\[
\begin{array}{c}
687.50 \\
-687.50 \\
\hline \\
7750 \\
\end{array}
\]

\[
\begin{array}{c}
7750 \\
\end{array}
\]

Answer

$77.50

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. Dana’s weekly earnings are calculated correctly; however, a calculation error occurs when determining Monique’s weekly earnings (127.5 \times 5), resulting in an incorrect final solution. The response contains an incorrect solution but applies a mathematically appropriate process.
Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

Show your work.

\[
\begin{align*}
&13.75 \\
\times &10 \\
\hline
137.50 \\
127.50 \\
\hline
265.00 \\
\end{align*}
\]

Answer

63.75

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The difference between daily earnings rather than weekly earnings is calculated. The response correctly addresses only some elements of the task.
Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week. On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

Show your work.

\[ D = 4 \text{ days} \]
\[ M = 5 \text{ days} \]

\[ 191.25 \]
\[ 127.5 \]
\[ 765 \]
\[ 637.5 \]

Answer

The difference is $127.50.

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. Although correct answers are provided for daily and weekly earnings as well as the difference between weekly earnings, the response contains limited work to support them. The response contains the correct solution but required work is incomplete.
Dana and Monique are dog groomers. Dana’s workday is 10 hours and Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.

On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in 8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of the week Dana and Monique groom the same number of dogs per workday as they did on Monday, what will be the difference between their weekly earnings?

**Show your work.**

\[
\begin{align*}
13 & 2 \\
12.75 & \times 15 \\
183.75 & \\
127.50 & \\
191.25 & \\
\end{align*}
\]

**Answer**

191.25 is my answer.

**Score Point 0 (out of 2 points)**

Although Dana’s daily earnings are calculated correctly, holistically this calculation alone is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
Dana and Monique are dog groomers. Dana’s workday is 10 hours and
Monique’s workday is 8 hours. Dana and Monique each work 40 hours per week.
On Monday, Dana groomed 15 dogs in 10 hours and Monique groomed 10 dogs in
8 hours. They each earn $12.75 for each dog groomed. Assuming that for the rest of
the week Dana and Monique groom the same number of dogs per workday as they
did on Monday, what will be the difference between their weekly earnings?

Show your work.

\[
\begin{align*}
\text{Dana} & \quad \text{Monique} \\
$12.75 & \quad $12.75 \\
- 10 & \quad 8 \\
\underline{12.65} & \quad \underline{12.67} \\
- 15 & \quad - 15 \\
\underline{12.50} & \quad \underline{12.52}
\end{align*}
\]

Answer

Their earnings will decrease.

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 of subtracting hours from
dollars is used to determine the solution.
The formula below is used to convert a temperature in degrees Celsius, $C$, to a temperature in degrees Fahrenheit, $F$.

$$F = 1.8C + 32$$

The high temperature in a mountain city was $15^\circ C$. What was the high temperature in degrees Fahrenheit?

*Show your work.*

*Answer* ______$^\circ F$
EXEMPLARY RESPONSE

The formula below is used to convert a temperature in degrees Celsius, \( C \), to a temperature in degrees Fahrenheit, \( F \).

\[
F = 1.8C + 32
\]

The high temperature in a mountain city was 15°C. What was the high temperature in degrees Fahrenheit?

Show your work.

\[
F = 1.8 \times 15 + 32 \\
F = 27 + 32 = 59
\]

Or other valid process

\[ \text{Answer} \quad 59^\circ F \]
The formula below is used to convert a temperature in degrees Celsius, C, to a temperature in degrees Fahrenheit, F.

\[ F = 1.8C + 32 \]

The high temperature in a mountain city was 15°C. What was the high temperature in degrees Fahrenheit?

\[ \text{Show your work.} \]

\[ F = 1.8(15) + 32 \]
\[ F = 27 + 32 \]
\[ F = 59 \]

Answer 59 °F

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The response correctly uses the given formula to convert the high temperature to degrees Fahrenheit.
The formula below is used to convert a temperature in degrees Celsius, $C$, to a temperature in degrees Fahrenheit, $F$.

$$F = 1.8C + 32$$

The high temperature in a mountain city was $15^\circ C$. What was the high temperature in degrees Fahrenheit?

**Show your work.**

$$F = 1.8 \times 15 + 32$$

$$59^\circ F$$

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The response correctly uses the given formula to convert the high temperature to degrees Fahrenheit.
The formula below is used to convert a temperature in degrees Celsius, $C$, to a temperature in degrees Fahrenheit, $F$.

$$F = 1.8C + 32$$

The high temperature in a mountain city was 15°C. What was the high temperature in degrees Fahrenheit?

*Show your work.*

\[
\begin{align*}
1.8 \times 15 + 32 &= 290 \\
&= 59^\circ F
\end{align*}
\]

*Answer* 59 $^\circ F$

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The response correctly uses the given formula to convert the high temperature to degrees Fahrenheit.
The formula below is used to convert a temperature in degrees Celsius, C, to a temperature in degrees Fahrenheit, F.

\[ F = 1.8C + 32 \]

The high temperature in a mountain city was 15°C. What was the high temperature in degrees Fahrenheit?

Show your work.

\[ \begin{align*}
F &= 1.8C + 32 \\
F &= 1.8 \times 15 + 32 \\
F &= 270 + 32 \\
F &= 302
\end{align*} \]

\[ \text{Answer: } 302 \, ^\circ\text{F} \]

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. This response contains a correct equation \((F = 1.8 \times 15 + 32)\); however, there is a calculation error in solving for the degrees Fahrenheit, \((1.8 \times 15 = 270)\). This response contains an incorrect solution but applies a mathematically appropriate process.
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The response correctly multiples 1.8 and 15 to get 27°F; however, the constant in the formula is omitted while converting from degrees of Celsius to degrees of Fahrenheit. This response correctly addresses only some elements of the task.
The formula below is used to convert a temperature in degrees Celsius, $C$, to a temperature in degrees Fahrenheit, $F$.

$$F = 1.8C + 32$$

The high temperature in a mountain city was 15°C. What was the high temperature in degrees Fahrenheit?

**Show your work.**

$$F = 1.8\times15 + 32$$

$$F = 27 + 32$$

$$F = 59$$

**Answer:** 59°F

**Score Point 1 (out of 2 points)**

This response demonstrates only a partial understanding of the mathematical concepts in the task. This response contains a correct equation ($F = 1.8 \times 15°C + 32$); however, there is a calculation error in solving for the degrees Fahrenheit, ($1.8 \times 15 = 270$). This response contains an incorrect solution but applies a mathematically appropriate process.
The formula below is used to convert a temperature in degrees Celsius, C, to a temperature in degrees Fahrenheit, F.

\[ F = 1.8C + 32 \]

The high temperature in a mountain city was 15°C. What was the high temperature in degrees Fahrenheit?

Show your work.

\[ \begin{align*}
32 + 1.8(15) \\
338 + 15 \\
507
\end{align*} \]

Answer 507 °F

Score Point 0 (out of 2 points)

Although this response correctly writes the expression to convert to degrees Fahrenheit, the student does not apply the order of operations properly. Holistically this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
The formula below is used to convert a temperature in degrees Celsius, $C$, to a temperature in degrees Fahrenheit, $F$.

$$F = 1.8C + 32$$

The high temperature in a mountain city was $15^\circ C$. What was the high temperature in degrees Fahrenheit?

**Show your work.**

$$15 \div 1.8 = 8.3$$

$$8.3 + 32 = 40.3$$

**Answer**

$40.3^\circ F$

---

**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. This response incorrectly divides 15 by 1.8.
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

Show your work.

Answer __________ pieces
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

Show your work.

9 feet × 12 inches = 108 inches per roll of ribbon

108 ÷ 15 = 7.2 pieces per roll

7 × 5 = 35 pieces

Or other valid process

Answer ________ pieces
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

Show your work.

1. \[ 1 \text{ ft} = 12 \text{ in.} \]
2. \[ 9 \text{ ft} = 108 \text{ in.} \]
3. \[ \frac{108}{15} = \frac{22}{3} \text{ in. per roll} \]
4. \[ 5 \times \frac{22}{3} = \frac{110}{3} \text{ pieces} \]
5. \[ \frac{110}{3} \approx 36.67 \]

Answer: 36 pieces

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of pieces that can be cut from a single roll of ribbon is calculated correctly and appropriately multiplied to account for all 5 rolls of ribbon.
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

Show your work.

\[
\frac{9 \times 12}{15} = \frac{108}{15} = \frac{7\frac{3}{15}}{1} \rightarrow 7
\]

\[
\frac{7\frac{3}{15}}{5} \div 108 \div 1.05 = \frac{7 \times 35}{3}
\]

Answer \(35\) pieces

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of pieces that can be cut from a single roll of ribbon is calculated correctly and appropriately multiplied to account for all 5 rolls of ribbon.
This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of pieces that can be cut from a single roll of ribbon is calculated correctly and appropriately multiplied to account for all 5 rolls of ribbon. As per Scoring Policy #6, the work that has been crossed out should not be considered in scoring.
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. 15-inch pieces are cumulatively added until 9 feet is reached; however, the count of pieces skips from 5 pieces to 7 pieces, resulting in an incorrect number of pieces per roll. The result is then appropriately multiplied to account for all 5 rolls of ribbon. The response contains an incorrect solution but applies a mathematically appropriate process.
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

Show your work.

\[ \begin{align*}
9 \times 15 &= 135 \\
45 \times 12 &= 540 \\
540 \div 15 &= 36
\end{align*} \]

Answer \( 36 \) pieces

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The total length in inches of all 5 rolls of ribbon is calculated correctly and appropriately divided by 15 to calculate the number of pieces that can be cut; however, this approach fails to account for each individual roll having some length of scrap material left over. The response correctly addresses only some elements of the task.
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

Show your work.

12 inches = 1 foot

12
x 9
108

\[ \frac{7.2}{15} \times 5 = 18 \]

7 pieces with 6 inches left over.

Answer: 7 pieces

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of pieces that can be cut from a single roll of ribbon is calculated correctly; however, this result is never multiplied to account for all 5 rolls of ribbon. The response correctly addresses only some elements of the task.
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

Show your work.

\[
\begin{align*}
9 \times \frac{45}{5} \times \frac{15}{15} &= \frac{9 \times 45}{5 \times 15} \\
&= \frac{405}{75} \\
&= 5.4
\end{align*}
\]

Answer: 6 pieces

Score Point 0 (out of 2 points)

Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The total length in feet of all 5 rolls of ribbon is calculated correctly; however, it is never converted into inches and is inappropriately multiplied by 15 rather than divided by 15.
A seamstress needs to cut 15-inch pieces of ribbon from a roll of ribbon that is 9 feet in length. What is the greatest number of 15-inch pieces the seamstress can cut from 5 of these rolls of ribbon?

*Show your work.*

Answer: 72 pieces

**Score Point 0 (out of 2 points)**

Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The length of one roll of ribbon is correctly converted to inches and then divided by 15 to calculate the number of pieces that can be cut; however, this result is never multiplied to account for all 5 rolls of ribbon and a decimal point is missing from the solution.
It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine $x$, the number of fire extinguishers needed for a building that has 135,000 square feet.

*Show your work.*

*Answer* _______________ fire extinguishers
EXEMPLARY RESPONSE

It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine \( x \), the number of fire extinguishers needed for a building that has 135,000 square feet.

*Show your work.*

\[
6,000 \times x = 135,000
\]

\[
x = \frac{135,000}{6,000}
\]

\[
x = 22.5
\]

Or other valid process

*Answer* 22 or 23 or 22.5 fire extinguishers
It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine $x$, the number of fire extinguishers needed for a building that has 135,000 square feet.

**Show your work.**

\[
6,000 \times x = 135,000
\]

\[
\begin{array}{c}
900000 \\
12000 \\
\hline
780000 \\
12000 \\
\hline
768000
\end{array}
\]

\[
\frac{768000}{6000} = 128
\]

**Answer**  \( 23 \) fire extinguishers

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The equation is correctly written and solved with the appropriate answer indicated. This response indicates that the student has completed the task correctly, using mathematically sound procedures.
It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine \( x \), the number of fire extinguishers needed for a building that has 135,000 square feet.

**Show your work.**

\[
\begin{align*}
6000 \times 2 &= 12,000 \\
6000 \times 5 &= 30,000 \\
6000 \times 7 &= 42,000 \\
6000 \times 6 &= 36,000 \\
6000 \times 12 &= 72,000 \\
6000 \times 23 &= 138,000 \\
6000 \times 25 &= 150,000
\end{align*}
\]

\[
6000 \times x = 135,000
\]

\[
6000 \times 22.5 = 135,000
\]

**Answer** 22.5 fire extinguishers

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The correct equation is provided along with the correct solution.
GUIDE PAPER 3

It is recommended that one fire extinguisher be available for every 5,000 square feet in a building. Write and solve an equation to determine \( x \), the number of fire extinguishers needed for a building that has 135,000 square feet.

\[
6,000x = 135,000
\]

\[
\frac{135,000}{6,000} = 22.5
\]

Answer: 22 fire extinguishers

Score Point 2 (out of 2 points)
This response demonstrates a thorough understanding of the mathematical concepts in the task. The equation is correctly written and solved with the appropriate answer indicated. This response indicates that the student has completed the task correctly, using mathematically sound procedures.
It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine \( x \), the number of fire extinguishers needed for a building that has 135,000 square feet.

Show your work.

\[ 6,000x = 135,000 \div 6,000 \]

\[ x = \frac{135,000}{6,000} \]

\[ x = 22.5 \]

Answer: 22.5 fire extinguishers

Score Point 1 (out of 2 points)
This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of fire extinguishers is correctly determined; however, an incorrect equation is provided to solve for the solution. This response correctly addresses only some elements of the task.
GUIDE PAPER 5

55

It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine $x$, the number of fire extinguishers needed for a building that has 135,000 square feet.

Show your work.

Answer

You would need 23 fire extinguishers

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The response correctly solves for the proper number of fire extinguishers ($135,000 \div 6,000$); however, an equation is not provided. This response contains the correct solution but required work is incomplete.
GUIDE PAPER 6

It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine $x$, the number of fire extinguishers needed for a building that has 135,000 square feet.

Show your work.

\[
\frac{22.5}{135000} \]

Answer: 22.5 fire extinguishers

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The response correctly solves for the proper number of fire extinguishers; however, an equation is not provided. This response correctly addresses only some elements of the task.
GUIDE PAPER 7

It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine \( x \), the number of fire extinguishers needed for a building that has 135,000 square feet.

**Show your work.**

\[
x + 6,000 = 135,000
\]

\[
x = 129,000
\]

**Answer** 129,000 fire extinguishers

---

**Score Point 0 (out of 2 points)**

Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The equation written is incorrect and is used to determine the incorrect number of fire extinguishers.
It is recommended that one fire extinguisher be available for every 6,000 square feet in a building. Write and solve an equation to determine $x$, the number of fire extinguishers needed for a building that has 135,000 square feet.

*Show your work.*

```
Answer 242,000 fire extinguishers
```

**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. Values from the prompt are inappropriately added.
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

![Smaller Cereal Box](image)

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

*Show your work.*

*Answer* ___________________ cubic inches
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

*Show your work.*

Volume of smaller box: \[7\frac{3}{4} \times 2 \times 12 = 186\text{ cubic inches}\]

Volume of larger box: 
\[
0.8h = 12 \\
\frac{h}{0.8} = 12 \\
\frac{h}{0.8} = 15\text{ inches} \\
7\frac{3}{4} \times 2 \times 15 = 232.5\text{ cubic inches}
\]

Difference in volume: 
\[232.5 - 186 = 46.5\]

Or other valid process

46.5

*Answer* ________________ cubic inches
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

![Smaller Cereal Box](image)

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

*Show your work.*

\[
\begin{align*}
\text{Small} &= 12 \cdot 2 \cdot 7.75 = 186 \text{ in}^3 \\
\text{Large} &= 15 \cdot 2 \cdot 7.75 = 232 \frac{1}{2} \text{ in}^3 \\
\text{Difference} &= 232 \frac{1}{2} \text{ in}^3 - 186 \text{ in}^3 = 46 \frac{1}{2} \text{ in}^3
\end{align*}
\]

*Answer* 46½ cubic inches

---

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The response correctly determines the volume of both cereal boxes and then subtracts for a correct solution of the difference in the volumes. This response indicates that the student has completed the task correctly, using mathematically sound procedures.
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

![Smaller Cereal Box](image)

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

**Show your work.**

\[
\frac{12}{x} = \frac{8}{10}
\]

\[
8x = 120
\]

\[
x = 15
\]

\begin{align*}
A &= 12 \times 2 \times 7\frac{3}{4} \\
   &= 24 \times \frac{31}{4} \\
   &= 186.0 \\
B &= 15 \times 2 \times 7\frac{3}{4} \\
   &= 30 \times \frac{31}{4} \\
   &= 465 \\
   &= 232.5 \text{ in}^3
\end{align*}

\[
\frac{232.5 - 186.0}{46.5} = 4.65 \text{ cubic inches}
\]

**Answer** 46.5 cubic inches

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The response uses ratios to correctly determine the height of the larger box. The volume of both cereal boxes is correctly calculated and the difference in the volumes is determined for the correct solution. This response indicates that the student has completed the task correctly, using mathematically sound procedures.
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

The height of the smaller box is 1/4 of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

**Show your work.**

**Answer** $46 \frac{1}{2}$ cubic inches

---

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The response correctly determines the volume of both cereal boxes and then subtracts for a correct solution of the difference in the volumes. As per Scoring Policy #6, if the student has written more than one response but has crossed some out, raters should score only the response that has not been crossed out.
A company sells cereal in two different sized boxes. The smaller box has the dimensions shown below.

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

**Show your work.**

\[ S \quad V = 12 \times 2 \times 7.75 = 186 \quad \left( \frac{235.5}{186} \right) \]

\[ L \quad V = 15 \times 2 \times 7.75 = 235.5 \]

\[ \frac{235.5 - 186}{186} \approx 0.26 \]

**Answer**  49.5 cubic inches

---

**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 smaller cereal box is correctly calculated; however, the work for the volume of the larger cereal box contains a calculation error. This response contains an incorrect solution but applies a mathematically appropriate process.
GUIDE PAPER 5

A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

Smaller Cereal Box

The height of the smaller box is 50% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

Show your work.

\[
\begin{align*}
12 \times 2 \times 7 \frac{3}{4} & = 186 \\
12 \times 2 \times 7 \frac{3}{4} & = 186 \\
\end{align*}
\]

Answer: \(3.1\) cubic inches

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 smaller cereal box is correctly calculated; however, the height of the larger cereal box is incorrect resulting in an incorrect volume of the larger cereal box. The difference between the two volumes is then used to determine the solution. This response contains an incorrect solution but applies a mathematically appropriate process.
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

Show your work.

\[
\begin{align*}
7\frac{3}{4} & \rightarrow 31 \\
\frac{12}{2} \times \frac{31}{4} &= 186
\end{align*}
\]

Answer _________ cubic inches

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 smaller cereal box is correctly calculated. The volume of the larger cereal box is calculated incorrectly \((186 \times 2)\), then the difference between the two volumes is determined for the solution. This response contains an incorrect solution but applies some mathematically appropriate processes.
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

![Smaller Cereal Box](image)

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

*Show your work.*

\[ V = L \times W \times H \]
\[ V = \frac{7}{4} \times 2 \times 12 \]
\[ V = 126 \]

*Answer:* 126 cubic inches

---

**Score Point 0 (out of 2 points)**

Holistically this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although the equation for the volume of the small cereal box is correctly shown, it contains a calculation error and no other work is provided.
A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.

**Smaller Cereal Box**

![Diagram of a cereal box with dimensions 7 3/4 in. by 2 in. by 12 in.]

The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. What is the difference in the volumes of the two boxes?

**Show your work.**

\[
\begin{align*}
\text{Volume of smaller box} &= 7.5 \times 2 \times 1.2 \times \frac{3}{4} \times \frac{5}{4} \\
\text{Volume of larger box} &= 7.5 \times 2 \times 1.2 \times \frac{3}{4} \times \frac{5}{4} \times \frac{5}{4} \\
\text{Difference in volumes} &= \text{Volume of larger box} - \text{Volume of smaller box}
\end{align*}
\]

**Answer** \(317.20\) cubic inches

---

**Score Point 0 (out of 2 points)**

Holistically this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The volume of the smaller box is shown; however, it is unclear how it was calculated. The other work contains multiple incorrect procedures that demonstrate no understanding of how to use this value.
The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x + 5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

Equivalent expression ____________________________

Use your equivalent expression to find the area of Brian's garden, in square feet, if $x = 3$ and $y = 4$.

Show your work.

Area __________ square feet
The area of Brian's rectangular garden, in square feet, can be found by using the expression \(6(2x+5y)\). Use the distributive property to write an equivalent expression for the area of Brian's garden.

Equivalent expression: \(12x + 30y\)

Use your equivalent expression to find the area of Brian's garden, in square feet, if \(x = 3\) and \(y = 4\).

Show your work.

\[
12(3) + 30(4) \\
36 + 120 \\
156
\]

Or other valid process

Area: 156 square feet
The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x + 5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

Equivalent expression $$(12x + 30y)$$

Use your equivalent expression to find the area of Brian's garden, in square feet, if $x = 3$ and $y = 4$.

Show your work.

$$12(3) + 30(4)$$

$$36 + 120$$

$$156$$

Area $156$ square feet

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The distributive property is correctly applied to the expression to construct an equivalent expression. This equivalent expression is used to correctly solve for the area of the garden. This response indicates that the student has completed the task correctly, using mathematically sound procedures.
The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x + 5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

*Equivalent expression* \(12x + 30y\)

Use your equivalent expression to find the area of Brian's garden, in square feet, if \(x = 3\) and \(y = 4\).

*Show your work.*

\[
12(3) + 30(4) \\
36 + 120 = 156
\]

*Area* \(156\) square feet

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The distributive property is correctly applied to the expression to construct an equivalent expression. This equivalent expression is used to correctly solve for the area of the garden.
The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x+5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

Equivalent expression $6(2x+5y)$

Use your equivalent expression to find the area of Brian's garden, in square feet, if $x = 3$ and $y = 4$.

Show your work.

\[
\begin{align*}
12x \cdot 3 &= 36 \\
30x \cdot 4 &= 120 \\
120 + 36 &= 156
\end{align*}
\]

Area $156$ square feet

**Score Point 2 (out of 2 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The distributive property is correctly applied to the expression to construct an equivalent expression. This equivalent expression is used to correctly solve for the area of the garden.
GUIDE PAPER 4

The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x + 5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

**Equivalent expression**

$12x + 5y$

Use your equivalent expression to find the area of Brian's garden, in square feet, if $x = 3$ and $y = 4$.

**Show your work.**

1. $12x + 5y$
2. $12 \times 3 + 5 \times 4$
3. $36 + 20$
4. $56$ square feet

**Area**

$56$ square feet

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The value of 6 is only distributed to the term $2x$ rather than to both terms within the parentheses; as a result, the expression is not equivalent to the given expression. The student then correctly solves for the area of the garden using the expression they created. As per Scoring Policy #8, 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.
The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x + 5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

**Equivalent expression** \(12x + 30y\)

Use your equivalent expression to find the area of Brian’s garden, in square feet, if \(x = 3\) and \(y = 4\).

**Show your work.**

(NO STUDENT RESPONSE GIVEN)

**Area** 156 square feet

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The distributive property is correctly applied to construct an equivalent expression; however, no work is provided for the calculation of the area for the garden. This response correctly addresses only some elements of the task.
GUIDE PAPER 6

The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x + 5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

Equivalent expression $6(4x + 2y + 6)$

Use your equivalent expression to find the area of Brian's garden, in square feet, if $x = 3$ and $y = 4$.

Show your work.

$6(2x + 5y) = 156$

$6 \times 26 = 156$

$6 \times 26 = 156$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. This response follows a correct procedure to determine the solution of 156 square feet; however, the expression provided is not equivalent. This response correctly addresses only some elements of the task.
The area of Brian’s rectangular garden, in square feet, can be found by using the expression $6(2x + 5y)$. Use the distributive property to write an equivalent expression for the area of Brian’s garden.

**Equivalent expression**

$6(2x + 5y)$

Use your equivalent expression to find the area of Brian’s garden, in square feet, if $x = 3$ and $y = 4$.

**Show your work.**

(NO STUDENT RESPONSE GIVEN)

**Area** 156 square 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 expression provided is copied from the prompt, multiplied by 1 and does not use the distributive property. Although the final solution is correct, as per Scoring Policy # 3, if students are directed to show work, a correct answer with no work shown receives no credit.
The area of Brian's rectangular garden, in square feet, can be found by using the expression $6(2x+5y)$. Use the distributive property to write an equivalent expression for the area of Brian's garden.

**Equivalent expression**

$$6(5y+2x)$$

Use your equivalent expression to find the area of Brian's garden, in square feet, if $x = 3$ and $y = 4$.

**Show your work.**

$$5y+420+6\bigcirc 26$$

$$2x \times 36$$

$$6\overline{26}$$

Area $\underline{41.3}$ square 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 expression is copied from the prompt and work is incorrect.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

**Answer** _______ chairs
A hotel has a number of meeting rooms, $m$, available for events. Each meeting room has 325 chairs. Write an equation to represent $c$, the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**

$$325m = c$$

If $m = 7$ use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

$$325 \times 7 = c$$

$$2275 = c$$

Or other valid process

**Answer** 2275 chairs
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( C \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**

\[ C = 325m \]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

\[ 7 \times 325 = 2275 \]

**Answer**

2275 chairs

**Score Point 3 (out of 3 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. An appropriate equation is written and used to correctly solve for the total number of chairs. This response indicates that the student has used mathematically sound procedures.
**GUIDE PAPER 2**

<table>
<thead>
<tr>
<th>Score</th>
<th>58</th>
</tr>
</thead>
</table>

A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation** \[ M \cdot 325 = c \]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

| 325.7 |

**Answer** \[ 2275 \text{ chairs} \]

---

**Score Point 3 (out of 3 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. An appropriate equation is written and used to correctly solve for the total number of chairs. Although a period is used in place of a multiplication sign, this constitutes an inconsequential error that does not detract from the correct solution and the demonstration of a thorough understanding.
A hotel has a number of meeting rooms, $m$, available for events. Each meeting room has 325 chairs. Write an equation to represent $c$, the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**  
$m \times 325 = c$

If $m = 7$ use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

$$325 \times 7 = (7 \times 5 = 35) + (7 \times 20 = 140) + (7 \times 300 = 2100) = 2275$$

**Answer**  
2275 chairs

**Score Point 3 (out of 3 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. An appropriate equation is written and used to correctly solve for the total number of chairs. This response indicates that the student has used mathematically sound procedures.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation** \[ m \times 325 \]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

I multiplied 325 chairs by the number of rooms which was 7 and got 2275 chairs total.

**Answer** 2275 chairs

**Score Point 2 (out of 3 points)**

This response demonstrates a partial understanding of the mathematical concepts in the task. A correct solution is determined by appropriately multiplying the number of chairs by the number of meeting rooms; however, the work does not contain an equation, only an expression is provided. The response addresses most, but not all aspects of the task.
A hotel has a number of meeting rooms, $m$, available for events. Each meeting room has 325 chairs. Write an equation to represent $c$, the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**

$325 \times 7 = c$

If $m = 7$ use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

$325 \times 7 = 2875$

$c = 2875$

**Answer**

2875 chairs

**Score Point 2 (out of 3 points)**

This response demonstrates a partial understanding of the mathematical concepts in the task. An appropriate equation is written; however, the value of 7 is used in place of the variable $m$. The response contains an incorrect solution due to a calculation error, but provides sound procedures.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**

\[ c = 325 \times m \]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

You have to multiply the # of meeting rooms by how many chairs are in each meeting room and it will equal 2275

**Answer** 2275 chairs

---

**Score Point 2 (out of 3 points)**

This response demonstrates a partial understanding of the mathematical concepts in the task. A correct solution is determined by appropriately multiplying the number of chairs by the number of meeting rooms; however, only an expression is provided. The response addresses most, but not all aspects of the task.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

\[
1M + C = 325
\]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

\[
7*325 = 1175
\]

**Answer**  
1175 chairs

**Score Point 1 (out of 3 points)**

This response demonstrates only a limited understanding of the mathematical concepts in the task. The number of chairs per meeting room is appropriately multiplied by the number of meeting rooms; however, the solution contains a calculation error and the equation provided is incorrect. This response exhibits multiple flaws related to misunderstanding of important aspects of the task.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**

\[
7 \times 325 = \]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

\[
\begin{align*}
7 \times 325 &= 325 \\
325 &= 325
\end{align*}
\]

**Answer**

325 chairs

---

**Score Point 1 (out of 3 points)**

This response demonstrates only a limited understanding of the mathematical concepts in the task. A solution is determined by appropriately multiplying the number of chairs by the number of meeting rooms; however, the solution contains a calculation error and the equation provided is incomplete. This response addresses some elements of the task correctly but reaches an inadequate solution.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

\[
\text{Equation} \quad c = (m \times 325)
\]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

(NO STUDENT RESPONSE GIVEN)

**Answer**

2275 chairs

**Score Point 1 (out of 3 points)**

This response demonstrates only a limited understanding of the mathematical concepts in the task. A correct solution is determined by appropriately multiplying the number of chairs by the number of meeting rooms, which is related to the \((m \times 325)\) term shown; however, the expression provided is incorrect and is not an equation.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation** \[ m \times c \]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

(NO STUDENT RESPONSE GIVEN)

**Answer** 2275 chairs

**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 expression provided does not support the final solution. Although the solution is correct, as per Scoring Policy #3, if students are directed to show work, a correct answer with no work shown receives no credit.
A hotel has a number of meeting rooms, \( m \), available for events. Each meeting room has 325 chairs. Write an equation to represent \( c \), the total number of chairs, in all of the meeting rooms at the hotel.

**Equation**

\[
325/c = m
\]

If \( m = 7 \) use your equation to find the total number of chairs in all of the meeting rooms at the hotel.

**Show your work.**

\[
325/c = m
\]
\[
325/c = 7
\]
\[
325/7 = 46.42857142857143 \text{ rounded } 47
\]

**Answer**

47 chairs

---

**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. This response contains an incorrect solution obtained using an obviously incorrect procedure.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends’ home?

*Show your work.*

*Answer _______ hours*
EXEMPLARY RESPONSE

Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends’ home?

Show your work.

\[4(60) + 6(65) + x(60) = 780\]
\[240 + 390 + 60x = 780\]
\[630 + 60x = 780\]
\[60x = 150\]
\[x = 2.5 \text{ hours}\]

Or other valid process

\[\frac{2.5}{\text{hours}}\]

Answer \(\frac{2.5}{\text{hours}}\)
This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of miles traveled on the first two days is correctly calculated and then subtracted from the total miles to determine the number of miles to be traveled on the third day. The speed from the third day is then used to correctly calculate the solution.
GUIDE PAPER 2

Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends' home?

Show your work.

\[
\begin{align*}
4 \times 60 &= 240 \text{ miles} \\
6 \times 65 &= 390 \text{ miles}
\end{align*}
\]

\[
\begin{array}{c}
2.5 \\
60 \quad 150
\end{array}
\]

\[
\begin{array}{c}
2.5 \\
150
\end{array}
\]

Answer \( \frac{2.5}{2} \) hours

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of miles to be traveled on the third day is correctly calculated and the speed from the third day is then used to correctly calculate the solution. This response indicates that the student has used mathematically sound procedures.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends' home?

Show your work. 

\[
\begin{array}{c}
60 \\
\times 4 \\
\hline
240 \\
\end{array} \quad \begin{array}{c}
365 \\
\times 6 \\
\hline
390 \\
\end{array}
\]

\[
\begin{array}{c}
240 \\
+ 390 \\
\hline
630 \\
\end{array} \quad \begin{array}{c}
780 \\
- 630 \\
\hline
150 \\
\end{array}
\]

Answer \(\frac{2}{3}\) hours

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of miles to be traveled on the third day is correctly calculated and a correct solution is determined, using mathematically sound procedures. The final division is performed mentally, which is acceptable.
Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. The number of miles to be traveled on the third day is correctly calculated; however, the solution of 2h 3m recorded on the answer blank is incorrect and not supported by the work shown. The response contains an incorrect solution but provides sound reasoning.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends’ home?

*Show your work.*

\[
\begin{align*}
\text{First day:} & \quad 630 \text{ miles} \\
\text{Second day:} & \quad 900 \\
\text{Third day:} & \quad 390 \\
\text{Total:} & \quad 1920 \\
\text{Answer:} & \quad 2 \text{ hours}
\end{align*}
\]

**Score Point 2 (out of 3 points)**

This response demonstrates a partial understanding of the mathematical concepts in the task. The number of miles traveled on the first two days is correctly calculated. The speed for the third day is added to the total miles for the first two days until 750 miles is reached; however, 30 miles is unaccounted for and the 2 hours is misinterpreted as the final solution. The response appropriately addresses most, but not all aspects of the task using mathematically sound procedures.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends' home?

**Show your work.**

\[
\begin{align*}
780 & \quad 60 \\
\times & \quad 4 \\
\hline
3120 & \\
\end{align*}
\]

\[
\begin{align*}
780 & \quad 65 \\
\times & \quad 3 \\
\hline
2340 & \\
\end{align*}
\]

**Answer** 3 hours

**Score Point 2 (out of 3 points)**

This response demonstrates a partial understanding of the mathematical concepts in the task. The number of miles to be traveled on the third day is correctly calculated; however, the solution of 3 hours recorded on the answer blank is incorrect and it is unclear how it was obtained. The response contains an incorrect solution but provides sound reasoning.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends' home?

Show your work.

\[
\begin{align*}
120 &+ 152 &= 272 \\
140 &+ 140 &= 280 \\
140 &+ 240 &= 380 \\
390 &+ 240 &= 630 \\
\end{align*}
\]

Answer: 630 hours

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. Although the total miles traveled on the first and second day are correctly calculated and added together; it was incorrectly interpreted as the final solution. This response exhibits multiple flaws related to misunderstanding of important aspects of the task. As per Scoring Policy #6, if the student has written more than one response but has crossed some out, raters should score only the response that has not been crossed out.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends’ home?

Show your work.

Answer $2 \frac{1}{2}$ hours

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The total miles traveled on the first two days is correctly calculated and added together; however, no other work is shown. This response contains the correct solution but required work is limited.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends’ home?

Show your work.

\[
\begin{array}{c}
\frac{60 \times 4}{240} \\
\frac{65 \times 6}{390} \\
\frac{340}{240} \\
\frac{150}{30}\end{array}
\]

Answer 2.5 hours

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The number of miles traveled on the first and second day is correctly calculated; however, the difference between the first day and second day is determined. This response addresses some elements of the task correctly but provides reasoning that is faulty.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends’ home?

Show your work.

\[
\begin{align*}
6 \times 4 &= 240 \\
780 &= 240 \\
540 &= \text{Answer} \\
\end{align*}
\]

Score Point 0 (out of 3 points)

The total miles traveled on the first day is correctly stated; however, the operation provided to show this calculation contains a transcription error for the speed traveled on the first day (6 \times 4 = 240), which is technically not calculated correctly. This value is subtracted from the total distance, ignoring the total miles traveled on the second day, and the result is provided as the final solution. Holistically the response is not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.
Jimmy and his family are on their way to visit some family friends who live 780 miles away from them. Based on the route they chose, they expect to complete their trip in three days. The distances and average speeds for the first two days driven are shown below.

- First day: 4 hours at an average speed of 60 miles per hour
- Second day: 6 hours at an average speed of 65 miles per hour

If the average speed on the third day is 60 miles per hour, how many more hours will it take for them to reach their family friends’ home?

Show your work.

<table>
<thead>
<tr>
<th>Days</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Miles</td>
<td>60</td>
<td>65</td>
<td>70</td>
<td>75</td>
<td>80</td>
<td>85</td>
</tr>
</tbody>
</table>

Answer _______ hours

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 table provided incorrectly infers a pattern of 2 more hours at a speed of 5 more miles per hour each additional day.
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

*Show your work.*

*Answer* ________ cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

*Answer* ________ unit cubes
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

*Show your work.*

\[ l \times w \times h = V \]

\[ 2\frac{1}{2} \times 3 \times 1\frac{1}{2} = 11\frac{1}{4} \]

*Or other valid process*

*Answer* $11\frac{1}{4}$ cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

\[ \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8} \]

\[ 11\frac{1}{4} + \frac{1}{8} = 11\frac{1}{4} \times 8 = 90 \]

*Or other valid process*

*Answer* 90 unit cubes
A right rectangular prism has a length of \( \frac{2\frac{1}{2}}{2} \) feet, a width of 3 feet, and a height of \( 1\frac{1}{2} \) feet. Unit cubes with side lengths of \( \frac{1}{2} \) foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

\[
V = \text{length} \times \text{width} \times \text{height}
\]

\[
V = 2\frac{1}{2} \times 3 \times 1\frac{1}{2}
\]

\[
V = \frac{1}{8}
\]

Answer: \( \frac{1}{8} \) cubic feet

How many \( \frac{1}{2} \)-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

\[
V = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}
\]

\[
V = \frac{1}{8}
\]

Answer: 90 unit cubes

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The volumes of the rectangular prism and the unit cube are correctly calculated. The volume of the rectangular prism is then divided by the volume of a unit cube to correctly solve for the number of unit cubes that will fit in the prism. This response indicates that the student has completed the task correctly, using mathematically sound procedures.
A right rectangular prism has a length of \(2 \frac{1}{2}\) feet, a width of 3 feet, and a height of \(1 \frac{1}{2}\) feet. Unit cubes with side lengths of \(\frac{1}{2}\) foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

**Show your work.**

\[
3 \cdot 2 \frac{1}{2} = 7 \frac{1}{2}
\]

\[
7 \frac{1}{2} \cdot 1 \frac{1}{2} = 11 \frac{1}{4}
\]

**Answer:** \(11 \frac{1}{4}\) cubic feet

How many \(\frac{1}{2}\)-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

I know \((\frac{1}{2})^3\) is \(\frac{1}{8}\), and \(11 \frac{1}{4} \div \frac{1}{8}\) is the same as \(11 \frac{1}{4} \cdot 8\), so I multiplied them to get the answer of 90 unit cubes.

**Answer:** 90 unit cubes

---

**Score Point 3 (out of 3 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The volumes of the rectangular prism and the unit cube are correctly calculated. The volume of the rectangular prism is then divided by the volume of a unit cube to correctly solve for the number of unit cubes that will fit in the prism. This response is complete and correct.
A right rectangular prism has a length of \(2 \frac{1}{2}\) feet, a width of 3 feet, and a height of \(1 \frac{1}{2}\) feet. Unit cubes with side lengths of \(\frac{1}{2}\) foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

\[
\begin{align*}
S \cdot \frac{1}{2} &= S \cdot 2 = 5 \cdot 2 = 10 \\
\frac{3}{2} \cdot \frac{1}{2} &= \frac{3 \times 2}{2} = \frac{6}{2} = 3 \\
\frac{1}{2} \times \frac{1}{2} \times 1 \frac{1}{2} &= 1 \frac{1}{4}
\end{align*}
\]

**Show your work.**

\[
V = l \times w \times h = 5 \cdot 6 \cdot 3 = 90
\]

**Answer** 11\(\frac{1}{4}\) cubic feet

How many \(\frac{1}{2}\)-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

\[
V = S \times 6 \times 3 = 90 \\
V = 90 \times 3
\]

**Answer** 90 unit cubes

**Score Point 3 (out of 3 points)**

This response demonstrates a thorough understanding of the mathematical concepts in the task. The volume of the rectangular prism is correctly calculated. The number of unit cubes that will fit along each side of the prism is calculated and then multiplied to determine the correct total number of unit cubes per prism.
A right rectangular prism has a length of $2 \frac{1}{2}$ feet, a width of 3 feet, and a height of $1 \frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

Show your work.

\[
L = 2.5 \\
W = 3 \\
H = 1.5
\]

Answer $11.25$ cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

\[
\frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \times 6 = \frac{6}{4} = 1 \frac{1}{2}
\]

Answer $7.5$ unit cubes

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. The volume of the rectangular prism is correctly calculated; however, the volume of a unit cube is not calculated correctly, the product of two side lengths is multiplied by 6 rather than by $1 \frac{1}{2}$. The number of unit cubes is correctly calculated using the incorrect volume of a unit cube. The response addresses most, but not all aspects of the task and reflects some minor misunderstanding of the underlying mathematical concepts.
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

Show your work.

The volume of the prism is calculated using the formula $V = L \times W \times H$.

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

$$V = \frac{5}{2} \times \frac{6}{2} \times \frac{3}{2} = \frac{45}{2} = 22.5$$

Answer $45$ cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

Answer $90$ unit cubes

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. A correct procedure is followed to determine the volume of the rectangular prism ($V = 2\frac{1}{2} \times 3 \times 1\frac{1}{2}$); however, a calculation error results in an incorrect solution. A diagram of the prism is used to count the number of unit cubes that will fit on each side of the prism and then those numbers are multiplied to determine the correct total number of unit cubes per prism. This response contains an incorrect solution but provides sound procedures.
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

Show your work.

Answer \( \frac{1155}{\text{cubic feet}} \)

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

Answer \( 90 \frac{1}{2} \text{ unit cubes} \)

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. The volume of the rectangular prism is calculated correctly and a drawing of the rectangular prism with a label on each side is provided. Another diagram is provided and each side is labeled with a length of the prism and how many $\frac{1}{2}$-foot unit cubes will fit on each side of the rectangular prism (\(1\frac{1}{2} \rightarrow 3 - \frac{1}{2}\) cubes, \(3 \rightarrow 6 - \frac{1}{2}\) cubes, \(2\frac{1}{2} \rightarrow 5 - \frac{1}{2}\) cubes); however, no additional operation is shown to support how the correct solution is obtained. The response appropriately addresses most, but not all aspects of the task.
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

Show your work.

\[
\begin{align*}
1 &= 2\frac{1}{2} \\
\omega &= 3 \\
4 &= 1\frac{1}{2} \\
AO &= \frac{1}{2} \\
11\frac{1}{4} + 1 &= 12\frac{1}{4}
\end{align*}
\]

Answer $12\frac{3}{4}$ cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

You would take one unit cube and divide that into 100, and you should get 200-unit cubes.

Answer 200 unit cubes

**Score Point 1 (out of 3 points)**

This response demonstrates only a limited understanding of the mathematical concepts in the task. The volume of the rectangular prism is correctly shown ($2\frac{1}{2} \times 3 \times 1\frac{1}{2}$) and a correct solution of $11\frac{3}{4}$ is calculated; however, an additional 1 is added to the answer resulting in an incorrect final solution of $12\frac{1}{4}$. The work shown for the number of unit cubes per prism is incorrect and incoherent. This response exhibits multiple flaws related to misunderstanding of important aspects of the task.
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism? 

Show your work. 

\[
\begin{array}{c}
\text{L} = 2.5 \\
\text{W} = 3 \\
\text{h} = 1.5 \\
\text{Volume} = \frac{2.5 \times 3 \times 1.5}{2} = 5.625 \\
\end{array}
\]

Answer: 5.625 cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

\[
\begin{array}{c}
\text{Number of cubes} = \frac{5.625}{0.5} = 11.25 \\
\end{array}
\]

Answer: 11.25 unit cubes

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The volume of the rectangular prism is correctly determined; however, the misplacement of the decimal point leads to an incorrect final solution for the volume of the prism. The volume of the prism is incorrectly divided by the length of one of the unit cubes sides. This response exhibits multiple flaws related to misunderstanding of important aspects of the task.
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

*Show your work.*

**Answer** $1\frac{3}{4}$ cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

**Answer** $2\frac{1}{2}$ unit cubes

**Score Point 1 (out of 3 points)**

This response demonstrates only a limited understanding of the mathematical concepts in the task. The volume of the rectangular prism is calculated correctly and a drawing of the rectangular prism with a label on each side is provided; however, no operations are shown to support how the solution is obtained. This response contains the correct volume for the rectangular prism but required work is limited. The number of unit cubes per prism is incorrect and no work is provided.
A right rectangular prism has a length of $2\frac{1}{2}$ feet, a width of 3 feet, and a height of $1\frac{1}{2}$ feet. Unit cubes with side lengths of $\frac{1}{2}$ foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

Show your work.

\[
\frac{1}{2} + \frac{1}{2} + \frac{1}{2} - \frac{1}{2} = 3\frac{3}{2} \quad \frac{9}{2} + \frac{6}{2} + \frac{1}{2} - \frac{1}{2} = 4\frac{1}{2} \\
\]

Answer \(\frac{1}{2}\) cubic feet

How many $\frac{1}{2}$-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

Answer \(3\) unit cubes

Score Point 0 (out of 3 points)

All of the given dimensions are improperly added together; holistically this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
A right rectangular prism has a length of \(2\frac{1}{2}\) feet, a width of 3 feet, and a height of \(1\frac{1}{2}\) feet. Unit cubes with side lengths of \(\frac{1}{2}\) foot are added to completely fill the prism with no space remaining. What is the volume, in cubic feet, of the right rectangular prism?

\[
\frac{3}{2} \times \frac{5}{2} = \frac{15}{4}
\]

Answer \(\frac{15}{4}\) cubic feet

How many \(\frac{1}{2}\)-foot unit cubes can be added to fill the prism completely? Use what you know about unit cubes or the side lengths of prisms to show your work or explain your answer.

\[
\frac{15}{4} \times \frac{1}{2} = \frac{15}{8}
\]

Answer \(\frac{15}{8}\) unit cubes

**Score Point 0 (out of 3 points)**

Although two of the given dimensions are properly multiplied, holistically this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EXEMPLARY RESPONSE

The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

arrow head = +15; bone = +721; clay bowl = 0; necklace = +462;

woven basket = -1200

Or other valid response

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

Artifacts found above sea level have a positive integer;

artifacts found at sea level are zero: artifacts found below sea level have a negative integer. Or other valid response
The table below shows the elevations at which different artifacts were found during an archaeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

Arrow head = 15 ft  
Bone = 721 ft  
Clay bowl = 0 ft  
Necklace = 462 ft  
Woven basket = -1200 ft

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

To find the answers to this problem you need to know that above sea level means that the numbers are positive so you don't add anything to the beginning of the number. Below sea level means the number is negative so you put a negative sign in front of the number. At sea level means that you make the number zero because it is like the starting point and it isn't negative or positive.

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The artifacts are listed correctly with a positive integer for above sea level, zero for at sea level and a negative integer for below sea level with a correct explanation of how the student determined if the integers are positive or negative or zero. This response indicates that the student has used mathematically sound procedures.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

-1,200, 0, +15, +462, +721

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

If an elevation requires a positive integer it has to say above sea level, for it to be zero it has to say sea level, and if it is a negative integer it has to say below sea level.

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The elevations are listed correctly with a plus or negative sign as indicated and a zero for sea level. This response contains sufficient work to demonstrate a thorough understanding of the mathematical concepts.
GUIDE PAPER 3

The table below shows the elevations at which different artifacts were found during an archaeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

Arrow Head: 15 ft  
Bone: 721 ft  
Clay Bowl: 0 ft  
Necklace: 462 ft  
Woven Basket: -1,200 ft

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

I determined if an elevation required a positive integer, zero, or negative integer by looking at the elevation. If the elevation is below sea level it has a negative integer. If the elevation is above sea level it has a positive integer. If the elevation is on sea level it has a zero for its elevation.

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The artifacts are listed correctly with a positive integer for above sea level, zero for at sea level and a negative integer for below sea level with a correct explanation of how the student determined if the integers were positive, negative or zero. This response indicates that the student has used mathematically sound procedures.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

| arrow head    | +15                        |
| clay bowl     | 0                          |
| necklace      | +462                       |
| woven basket  | -1,200                     |
| bone          | +721                       |

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

- The words above, below or sea level.

**Score Point 2 (out of 3 points)**

This response demonstrates a partial understanding of the mathematical concepts in the task. The artifacts are listed correctly with a positive integer for above sea level, zero for at sea level and a negative integer for below sea level. The explanation is incomplete as to how the student determined if it was a positive, negative or zero integer. This response appropriately addresses most, but not all aspects of the task.
GUIDE PAPER 5

The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

arrow head: 15 ft.
bone: 721 ft.
clay bowl: 0 ft.
necklace: -462 ft.
woven basket: -1,200 ft.

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

Sea level is equal to 0 so anything above sea level is positive and anything below than sea level is negative.

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. All of the artifacts are listed correctly with the exception of the necklace, which should have a positive sign by the integer. The explanation provides sound reasoning on how the negative, positive and zero are determined. This response contains an incorrect solution but provides sound reasoning and explanation.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

Arrow Head 15 Feet Bone 721 Feet Clay Bowl 0 Feet Necklace 462 Feet Woven Basket -1,200 Feet

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

Below Sea level means a negative integer and above sea level means a positive integer.

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. The artifacts are listed correctly with a positive integer for above sea level, zero for at sea level and a negative integer for below sea level. The explanation is incomplete as it does not address the zero at sea level. This response appropriately addresses most, but not all aspects of the task.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

(Arrow Head: +15ft); (Bone: +721ft); (Clay Bowl: 0ft); (Necklace: +462ft); (Woven Basket: -1,200ft)

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

(NO STUDENT RESPONSE GIVEN)

Score Point 1 (out of 3 points)
This response demonstrates only a limited understanding of the mathematical concepts in the task. The artifacts are listed correctly with a positive integer for above sea level, zero for at sea level and a negative integer for below sea level; however, the explanation is missing. This response contains the correct solution but required work is limited.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

| Clay bowl 0, arrow head -15, bone 721, necklace 462 |

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

if it was below sea level it was a negative integer, if it was above sea level it was a positive integer.

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The clay bowl, bone, and necklace artifacts are all listed correctly; however, the arrow head incorrectly has a negative sign and the woven basket is missing altogether. The explanation has correctly identified below as negative and above as positive; however, at sea level is not addressed. This response exhibits multiple flaws related to misunderstanding of important aspects of the task.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

arrow head = +15
bone = +721
clay bowl = 0
necklace = -462
woven basket = -1,200

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

by the text telling me below or above sea level. 0 meant on sea level.

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. All of the artifacts are listed correctly with the exception of the necklace, which should have a positive sign by the integer. The explanation for how the zero is determined is correct; however, the explanation for how the positive or negative integers are determined is incomplete. This response addresses some elements of the task correctly but reaches an inadequate solution and provides reasoning that is incomplete.
GUIDE PAPER 10

The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

0-0

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

sea level

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 response is incoherent and incorrect.
The table below shows the elevations at which different artifacts were found during an archeological dig.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>arrow head</td>
<td>15 feet above sea level</td>
</tr>
<tr>
<td>bone</td>
<td>721 feet above sea level</td>
</tr>
<tr>
<td>clay bowl</td>
<td>sea level</td>
</tr>
<tr>
<td>necklace</td>
<td>462 feet above sea level</td>
</tr>
<tr>
<td>woven basket</td>
<td>1,200 feet below sea level</td>
</tr>
</tbody>
</table>

Write the name of each artifact and the elevation at which each artifact was found using a positive integer, zero, or negative integer.

15 above sea level arrow head  721 above sea level bone  462 above sea level necklace  sea level clay bowl  1,200 below sea level woven basket

Explain how you determined if an elevation required a positive integer, zero, or negative integer.

on the chart it says if it is below sea level or above sea level or at sea level

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 response only copies the chart from the prompt.