

# New York NYSTP 2016 Grade 5 Math

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## **Grade 5 Mathematics Reference Sheet**

### **CONVERSIONS**

1 mile = 5,280 feet

1 mile = 1,760 yards

1 pound = 16 ounces

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 liter = 1,000 cubic centimeters

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### **FORMULAS**

Right Rectangular Prism

$V = Bh$  or  $V = lwh$

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Name: \_\_\_\_\_



# **New York State Testing Program**

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## **2016 Common Core Mathematics Test Book 1**

**Grade 5**

**April 13–15, 2016**

Released Questions

# Book 1



## TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before choosing your response.
- You have been provided with mathematics tools (a ruler and a protractor) and a reference sheet to use during the test. It is up to you to decide when each tool and the reference sheet will be helpful. You should use mathematics tools and the reference sheet whenever you think they will help you to answer the question.
- Plan your time.

- 1** Pax wants to make fruit punch for a party using the recipe below.

Fruit Punch
1.25 L orange juice
2.5 L cranberry juice
1 L ginger ale

He will make three times the amount of fruit punch listed in the recipe. What is the total amount of fruit punch, in liters, that Pax will make?

- A 4.53
- B 4.75
- C 12.90
- D 14.25

- 2** What is the value of the expression below?

$$\begin{array}{r} 3\frac{1}{4} \\ - 1\frac{7}{8} \\ \hline \end{array}$$

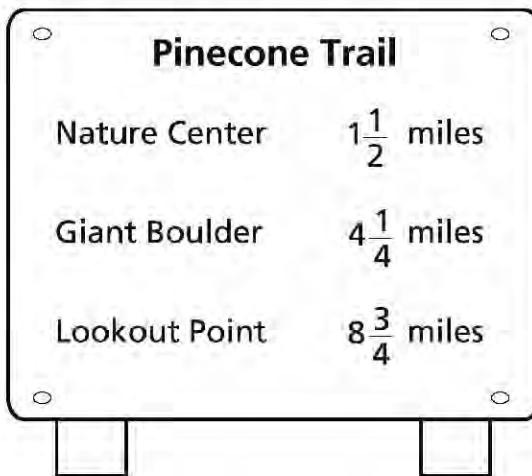
- A  $1\frac{1}{4}$
- B  $1\frac{3}{8}$
- C  $2\frac{3}{8}$
- D  $3\frac{1}{2}$

**GO ON**

**3** What is the value of the expression  $3,972 \div 12$ ?

- A 372
- B 336
- C 331
- D 306

**4** The sign below is located at the start of Pinecone Trail and shows the distances from the sign to different points of interest along the trail.



Sage hiked from the start of the trail to Lookout Point. She then hiked back to Giant Boulder to camp for the night. What was the total distance, in miles, that Sage hiked?

- A  $21\frac{3}{4}$
- B  $13\frac{1}{4}$
- C  $4\frac{1}{2}$
- D  $4\frac{1}{4}$

**5**

Which type of quadrilateral can have exactly 1 pair of parallel sides?

- A rectangle
- B rhombus
- C square
- D trapezoid

**GO ON**

**9**

What is the value of the expression below?

$$56 \div \frac{1}{17}$$

A  $\frac{1}{952}$

B  $\frac{17}{56}$

C  $3\frac{5}{17}$

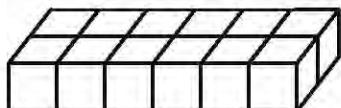
D 952

**GO ON**

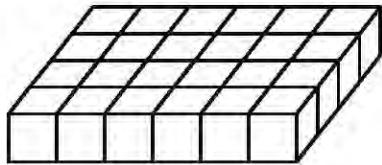
**10**

In her math class, Carla used unit cubes to build a right rectangular prism with a volume of 24 cubic units. The height of the prism was two units. Which figure could be the bottom layer of the prism?

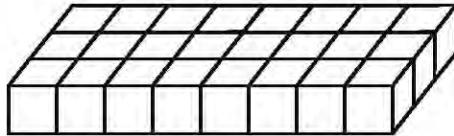
A



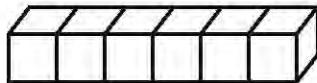
B



C



D



**GO ON**

**13**

Bettina spent \$75 on 5 shirts that each cost the same price. Three of the shirts were red. Which expression represents the total cost of the red shirts?

A  $75 \times \frac{3}{5}$

B  $75 \times \frac{5}{3}$

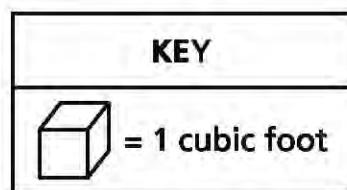
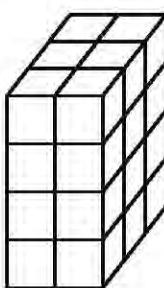
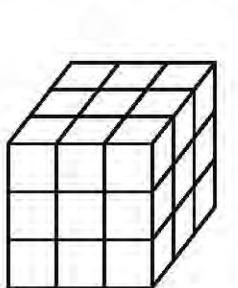
C  $\frac{75}{5} \times \frac{1}{3}$

D  $\frac{75}{3} \times \frac{1}{5}$

**GO ON**

**14**

The two right rectangular prisms below have different volumes.



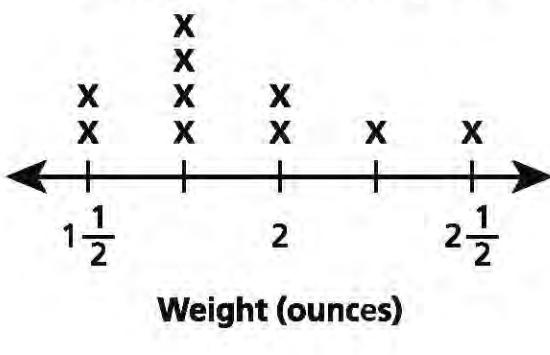
What is the difference in volume, in cubic feet, of the two prisms?

- A 1
- B 3
- C 6
- D 9

**15**

The line plot shows the weights of ten eggs laid by one hen.

**EGGS LAID BY ONE HEN**



What is the total weight, in ounces, of the four heaviest eggs?

- A 4
- B 7
- C  $8\frac{1}{2}$
- D  $8\frac{3}{4}$

**GO ON**

**16**

The table below lists the capacity, in quarts, of four different fish tanks at a pet store.

### FISH TANK CAPACITY

Fish Tank	Capacity (quarts)
Pacific	240
Fresh	15
Tropic	120
Bahama	60

Which fish tank has a capacity of 60 gallons?

- A Pacific
- B Fresh
- C Tropic
- D Bahama

**17**

Which number sentence is true?

- A  $0.35 > 0.36$
- B  $0.3 < 0.04$
- C  $0.3 > 0.20$
- D  $0.75 < 0.7$

**GO ON**

**18**

Mr. Hinckley owns 83 acres of land. He divides the land into eight equal sections to sell to eight buyers. Which phrase describes how much land, in acres, each buyer will receive?

- A more than 9 and less than 10
- B more than 10 and less than 11
- C more than 11 and less than 12
- D more than 12 and less than 13

**GO ON**

# Book 2



## TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before choosing your response.
- You have been provided with mathematics tools (a ruler and a protractor) and a reference sheet to use during the test. It is up to you to decide when each tool and the reference sheet will be helpful. You should use mathematics tools and the reference sheet whenever you think they will help you to answer the question.
- Plan your time.

23

What is the value of the expression below?

$$8 + 24 \div (2 \times 6) - 4$$

- A 92
- B 76
- C 11
- D 6

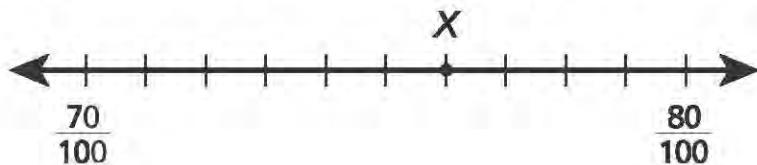
24

Parallelograms **always** belong to which category of shapes?

- A squares
- B rectangles
- C rhombuses
- D quadrilaterals

25

Which decimal **best** represents the location of point X on the number line below?



- A 0.076
- B 0.077
- C 0.76
- D 0.77

**GO ON**

**26**

What is  $1,748 \div 38$ ?

- A 41
- B 43
- C 46
- D 48

**27**

The table shows the number of computers donated to a school by each of 4 companies.

#### **COMPUTERS DONATED TO A SCHOOL**

Company	Number of Computers
A	25
B	40
C	25
D	30

All the donated computers were shared equally by 5 classrooms. Which expression represents the number of computers each classroom received?

- A  $120 \times \frac{5}{4}$
- B  $120 \times \frac{1}{4}$
- C  $120 \times \frac{4}{5}$
- D  $120 \times \frac{1}{5}$

**GO ON**

**28** Which expression is equivalent to 83,120 in expanded form using powers of 10?

- A  $(8 \times 10^5) + (3 \times 10^4) + (1 \times 10^3) + (2 \times 10^2)$
- B  $(8 \times 10^4) + (3 \times 10^3) + (1 \times 10^3) + (2 \times 10^2)$
- C  $(8 \times 10^4) + (3 \times 10^3) + (1 \times 10^2) + (2 \times 10^1)$
- D  $(8 \times 10^1) + (3 \times 10^1) + (1 \times 10^1) + (2 \times 10^1)$

**29** Which measurement is equivalent to 3 meters?

- A 9 centimeters
- B 36 centimeters
- C 100 centimeters
- D 300 centimeters

**30** Mr. Davis is creating a spice mixture for a recipe.

- $\frac{2}{5}$  of the spice mixture was oregano
- $\frac{1}{3}$  of the spice mixture was basil

The remaining spice mixture was chili powder. What fraction of the total amount of spice mixture was oregano and basil?

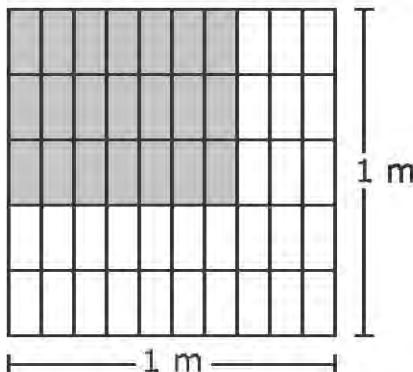
- A  $\frac{4}{15}$
- B  $\frac{3}{8}$
- C  $\frac{5}{8}$
- D  $\frac{11}{15}$

**GO ON**

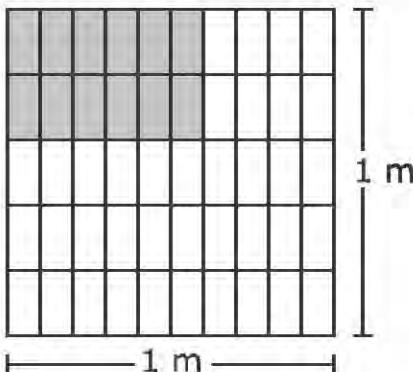
40

Which model shows one way to determine the area of a rectangle that is  $\frac{7}{10}$  meter long and  $\frac{3}{5}$  meter wide?

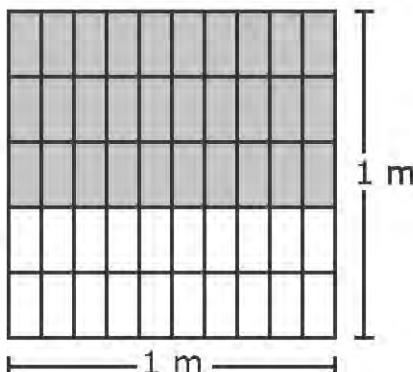
A



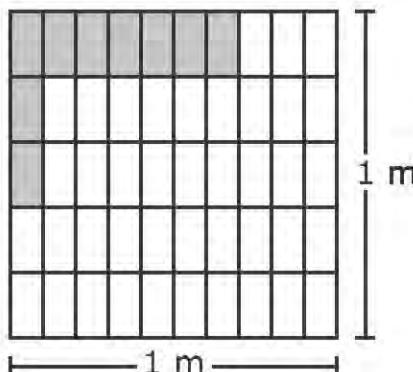
C



B



D



41

A swimming pool is shaped like a right rectangular prism. The pool is 36 feet long and 20 feet wide. What is the total amount of water, in cubic feet, needed to fill the pool to a depth of 4 feet?

A 800

B 864

C 2,880

D 5,760

**GO ON**

**42**

Kim's class voted on a location for a field trip.

- $\frac{3}{4}$  of the class voted for the museum
- $\frac{1}{8}$  of the class voted for the zoo

The rest of the class voted for the nature park.

What fraction of the class voted for the nature park?

A  $\frac{1}{8}$

B  $\frac{1}{2}$

C  $\frac{5}{8}$

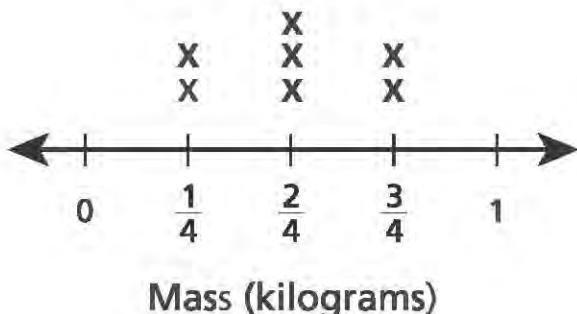
D  $\frac{7}{8}$

**GO ON**

**43**

Jen determined the masses of 7 rocks. She recorded the mass of each rock on the line plot below.

### MASS OF ROCKS



What is the total mass, in kilograms, of the 7 rocks?

- A  $1\frac{5}{8}$
- B  $1\frac{1}{2}$
- C  $3\frac{1}{4}$
- D  $3\frac{1}{2}$

**44**

To feed his plants, Logan creates a mixture that requires  $\frac{3}{8}$  cup of plant food for every gallon of water. If he uses  $10\frac{1}{2}$  gallons of water, what is the total amount of plant food he needs?

- A  $3\frac{15}{16}$  cups
- B  $6\frac{3}{10}$  cups
- C  $10\frac{3}{16}$  cups
- D  $10\frac{7}{8}$  cups

**GO ON**

**45**

Which expression is equivalent to  $4 + [4 \times (5 - 2)] \div 2$ ?

- A  $4 + 12 \div 2$
- B  $4 + 18 \div 2$
- C  $8 \times 3 \div 2$
- D  $8 \times 5 - 1$

**STOP**

# Book 3



## TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before writing your response.
- You have been provided with mathematics tools (a ruler and a protractor) and a reference sheet to use during the test. It is up to you to decide when each tool and the reference sheet will be helpful. You should use mathematics tools and the reference sheet whenever you think they will help you to answer the question.
- Be sure to show your work when asked.
- Plan your time.

**46**

Rearrange the numbers below so that they are listed in numerical order from least to greatest.

34.039 32.94 34.198 32.102 33.6

**Answer**

Least

Greatest

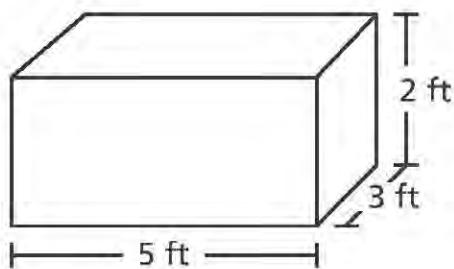
The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

**Answer** Between \_\_\_\_\_ and \_\_\_\_\_

**GO ON**

**47**

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

**Show your work.**

**Answer** \_\_\_\_\_ wooden cubes

**GO ON**

**48**

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

**Show your work.**

**Answer** \_\_\_\_\_ CDs

**GO ON**

**49**

Describe the relationship between  $n$  and 4 that will make the value of the expression  $7 \times \frac{n}{4}$  greater than 7.

**Answer**

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Describe the relationship between  $a$  and  $b$  that will make the value of the expression  $7 \times \frac{a}{b}$  equal to 7.

**Answer**

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**GO ON**

**50**

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

### DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total		

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

**Show your work.**

**Answer** \_\_\_\_\_ meters

**GO ON**

**51**

Antoine wrote the expressions shown below.

- Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$
- Expression B:  $\square \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

***Show your work or explain how you determined this number.***

***Answer***

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**GO ON**

**52**

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action," and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{9}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

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What fraction of the DVDs in Andy's collection is not "Action" or "Comedy?"

**Show your work.**

**Answer** \_\_\_\_\_

**GO ON**

**53**

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

**Show your work.**

**Answer** \$ \_\_\_\_\_

**GO ON**

**54**

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

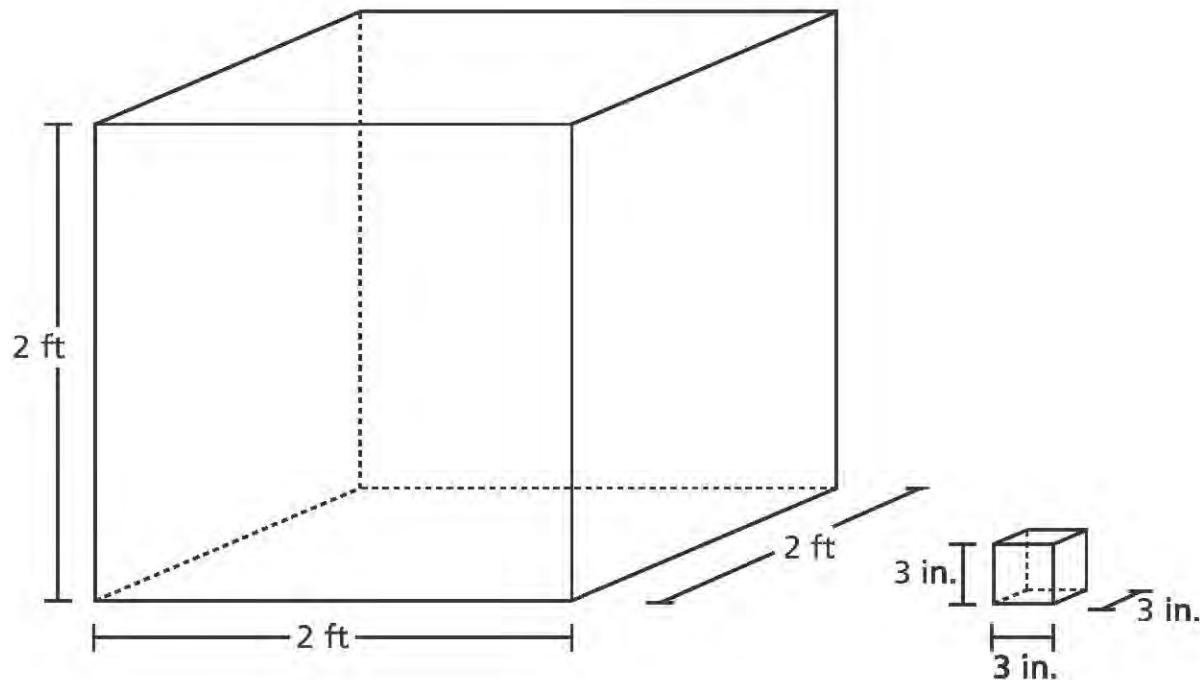
**Show your work.**

**Answer** \_\_\_\_\_ miles

**GO ON**

**55**

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

**Show your work.**

**Answer** \_\_\_\_\_ boxes of lotion

**STOP**

**THE STATE EDUCATION DEPARTMENT**  
**THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234**

**2016 Mathematics Tests Map to the Standards**

**Released Questions Available on EngageNY**

**Grade 5**

<b>Question</b>	<b>Type</b>	<b>Key</b>	<b>Points</b>	<b>Standard</b>	<b>Cluster</b>	<b>Secondary Standard(s)</b>	<b>Multiple Choice Questions:</b>		<b>Constructed Response Questions:</b>	
							<b>Percentage of Students Who Answered Correctly (P-Value)</b>	<b>Average Points Earned</b>	<b>P-Value (Average Points Earned ÷ Total Possible Points)</b>	
<b>Book 1</b>										
1	Multiple Choice	D	1	CCSS.Math.Content.5.NBT.B.7	Number and Operations in Base Ten			0.57		
2	Multiple Choice	B	1	CCSS.Math.Content.5.NF.A.1	Number and Operations—Fractions			0.64		
3	Multiple Choice	C	1	CCSS.Math.Content.5.NBT.B.6	Number and Operations in Base Ten			0.86		
4	Multiple Choice	B	1	CCSS.Math.Content.5.NF.A.2	Number and Operations—Fractions			0.64		
5	Multiple Choice	D	1	CCSS.Math.Content.5.G.B.4	Geometry			0.68		
9	Multiple Choice	D	1	CCSS.Math.Content.5.NF.B.7b	Number and Operations—Fractions			0.45		
10	Multiple Choice	A	1	CCSS.Math.Content.5.MD.C.3b	Measurement and Data	CCSS.Math.Content.5.MD.C.3a		0.61		
13	Multiple Choice	A	1	CCSS.Math.Content.5.NF.B.4a	Number and Operations—Fractions			0.71		
14	Multiple Choice	B	1	CCSS.Math.Content.5.MD.C.4	Measurement and Data			0.64		
15	Multiple Choice	D	1	CCSS.Math.Content.5.MD.B.2	Measurement and Data	CCSS.Math.Content.5.NF.A.1		0.38		
16	Multiple Choice	A	1	CCSS.Math.Content.5.MD.A.1	Measurement and Data			0.49		
17	Multiple Choice	C	1	CCSS.Math.Content.4.NF.C.7	Number and Operations in Base Ten			0.62		
18	Multiple Choice	B	1	CCSS.Math.Content.5.NF.B.3	Number and Operations—Fractions			0.56		
<b>Book 2</b>										
23	Multiple Choice	D	1	CCSS.Math.Content.5.OA.A.1	Operations and Algebraic Thinking			0.75		
24	Multiple Choice	D	1	CCSS.Math.Content.5.G.B.4	Geometry			0.57		
25	Multiple Choice	C	1	CCSS.Math.Content.4.NF.C.6	Number and Operations in Base Ten			0.74		
26	Multiple Choice	C	1	CCSS.Math.Content.5.NBT.B.6	Number and Operations in Base Ten			0.78		
27	Multiple Choice	D	1	CCSS.Math.Content.5.NF.B.4a	Number and Operations—Fractions			0.46		
28	Multiple Choice	C	1	CCSS.Math.Content.5.NBT.A.2	Number and Operations in Base Ten	CCSS.Math.Content.5.OA.A.1		0.62		

## Grade 5

## Released Questions Available on EngageNY

Question	Type	Key	Points	Standard	Cluster	Secondary Standard(s)	Multiple Choice Questions:		Constructed Response Questions:	
							Percentage of Students Who Answered Correctly (P-Value)	Average Points Earned	P-Value (Average Points Earned ÷ Total Possible Points)	
29	Multiple Choice	D	1	CCSS.Math.Content.4.MD.A.1	Measurement and Data		0.63			
30*	Multiple Choice			* Based on statistical analyses, it has been determined that this question will not be counted in determining students' test scores.						
40	Multiple Choice	A	1	CCSS.Math.Content.5.NF.B.4b	Number and Operations—Fractions		0.60			
41	Multiple Choice	C	1	CCSS.Math.Content.5.MD.C.5b	Measurement and Data		0.72			
42	Multiple Choice	A	1	CCSS.Math.Content.5.NF.A.2	Number and Operations—Fractions		0.50			
43	Multiple Choice	D	1	CCSS.Math.Content.5.MD.B.2	Measurement and Data		0.52			
44	Multiple Choice	A	1	CCSS.Math.Content.5.NF.B.6	Number and Operations—Fractions		0.37			
45	Multiple Choice	A	1	CCSS.Math.Content.5.OA.A.1	Operations and Algebraic Thinking		0.74			

## Book 3

46	Constructed Response		2	CCSS.Math.Content.5.NBT.A.3	Number and Operations in Base Ten			1.17	0.59
47	Constructed Response		2	CCSS.Math.Content.5.NF.B.7c	Number and Operations—Fractions	CCSS.Math.Content.5.MD.C.5		1.02	0.51
48	Constructed Response		2	CCSS.Math.Content.5.NBT.B.6	Number and Operations in Base Ten			1.42	0.71
49	Constructed Response		2	CCSS.Math.Content.5.NF.B.5b	Number and Operations—Fractions			0.91	0.45
50	Constructed Response		2	CCSS.Math.Content.5.MD.A.1	Measurement and Data	CCSS.Math.Content.5.NBT.B.7		0.80	0.40
51	Constructed Response		2	CCSS.Math.Content.5.OA.A.2	Operations and Algebraic Thinking			1.14	0.57
52	Constructed Response		3	CCSS.Math.Content.5.NF.A.2	Number and Operations—Fractions			1.53	0.51
53	Constructed Response		3	CCSS.Math.Content.5.NBT.B.7	Number and Operations in Base Ten			0.73	0.24
54	Constructed Response		3	CCSS.Math.Content.5.NF.B.6	Number and Operations—Fractions	CCSS.Math.Content.5.NF.A.1		0.61	0.20
55	Constructed Response		3	CCSS.Math.Content.5.MD.C.5b	Measurement and Data	CCSS.Math.Content.5.MD.A.1		0.60	0.20

\*This item map is intended to identify the primary analytic skills necessary to successfully answer each question. However, some questions measure proficiencies described in multiple standards, including a balanced combination of procedural and conceptual understanding.

## 2-Point Holistic Rubric

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

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

## **2016 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 does the work in other than a designated “Show your work” area, that work should still be scored. (Additional paper is an allowable accommodation for a student with disabilities if indicated on the student’s Individual Education Program or Section 504 Accommodation Plan.)
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. In questions that provide ruled lines for students to write an explanation of their work, mathematical work shown elsewhere on the page should be considered and scored.
4. If the student provides one legible response (and one response only), teachers should score the response, even if it has been crossed out.
5. If the student has written more than one response but has crossed some out, teachers should score only the response that has **not** been crossed out.
6. Trial-and-error responses are **not** subject to Scoring Policy #5 above, since crossing out is part of the trial-and-error process.
7. If a response shows repeated occurrences of the same conceptual error within a question, the student should **not** be penalized more than once.
8. In questions that require students to provide bar graphs,
  - in Grades 3 and 4 only, touching bars are acceptable
  - in Grades 3 and 4 only, space between bars does **not** need to be uniform
  - in all grades, widths of the bars must be consistent
  - in all grades, bars must be aligned with their labels
  - in all grades, scales must begin at 0, but the 0 does **not** need to be written
9. In questions requiring number sentences, the number sentences must be written horizontally.
10. In pictographs, the student is permitted to use a symbol other than the one in the key, provided that the symbol is used consistently in the pictograph; the student does not need to change the symbol in the key. The student may **not**, however, use multiple symbols within the chart, nor may the student change the value of the symbol in the key.
11. 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.
12. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question but that work results in a score of zero.

## **EXEMPLARY RESPONSE**

46

Rearrange the numbers below so that they are listed in numerical order from least to greatest.

34.039 32.94 34.198 32.102 33.6

<b>Answer</b>	32.102	32.94	33.6	34.039	34.198
	Least				Greatest

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

**Answer** Between 32.94 and 33.6

OR other valid response

## GUIDE PAPER 1

Additional

46

Rearrange the decimals below so that they are listed in numerical order from least to greatest.

34.039 32.94 34.198 32.102 33.6

Answer 32.102 | 32.94 | 33.6 | 34.039 | 34.198  
Least | Greatest

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 32.94 and 33.6

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The given values are correctly ordered from least to greatest and 33.01 is placed between the correct two numbers.

# **GUIDE PAPER 2**

46

Rearrange the decimals below so that they are listed in numerical order from least to greatest.

34.039 32.94 34.198 32.102 33.6

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 32.94 and 33.6

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The given values are correctly ordered from least to greatest and 33.01 is placed between the correct two numbers.

## GUIDE PAPER 3

46

Rearrange the decimals below so that they are listed in numerical order from least to greatest.

34.039 32.94 34.198 32.102 33.6

Answer 32.102 32.94 33.6 34.039 34.198  
Least Greatest

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 32.94 and 33.6

33.010

~~34.039~~  
~~32.940~~  
~~34.198~~  
~~32.102~~  
~~33.600~~

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The given values are correctly ordered from least to greatest and 33.01 is placed between the correct two numbers.

## GUIDE PAPER 4

46

Rearrange the decimals below so that they are listed in numerical order from least to greatest.

34.039 32.94 32.198 32.102 33.6

Answer 33.6 32.94 32.102 34.039 34.198  
Least Greatest

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 33.6 and 32.94

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. 33.01 is placed between the correct two numbers; however, the given values are not correctly ordered from least to greatest (33.6 and 32.102 are transposed).

# **GUIDE PAPER 5**

46

Rearrange the decimals below so that they are listed in numerical order from least to greatest.

~~34-1999 32-34 34-198 32-763-346~~

Answer 32.94 32.102 33.6 34.587 34.198  
Least Greatest

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 32.94 and 33.6

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. 33.01 is placed between the correct two numbers; however, the given values are not correctly ordered from least to greatest (32.94 and 32.102 are transposed).

## GUIDE PAPER 6

46

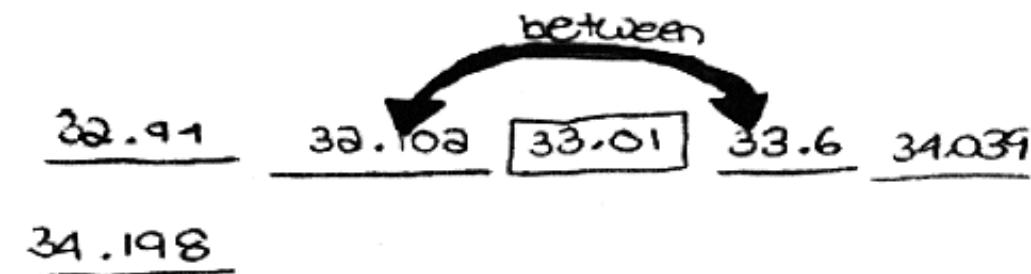
Rearrange the decimals below so that they are listed in numerical order from least to greatest.

34.039 32.94 34.198 32.102 33.6

Answer 32.94 32.102 33.6 34.039 34.198  
Least Greatest

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 32.102 and 33.6



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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The value of 33.01 does fall between 32.102 and 33.6; however, the given values are not correctly ordered from least to greatest (32.94 and 32.102 are transposed). Note that, although one of the values expected in the second part of the response is 32.94 and not 32.102 as written, this error is a direct result from the previous incorrect ordering of the given list. As per Scoring Policy #7, the student should not be penalized more than once for the same error.

# **GUIDE PAPER 7**

46

Rearrange the decimals below so that they are listed in numerical order from least to greatest.

4      2      5      3      1  
34.039 32.94 34.198 32.102 33.6

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 30,00<sup>35,01</sup> and 35,01

33.01  
30.00  
35.01

**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 given values are not correctly ordered from least to greatest (33.6 and 32.102 are transposed) and although the value of 33.01 does fall between 30.00 and 35.01, those values are not drawn from those given in the prompt.

# **GUIDE PAPER 8**

## Additional

46

Rearrange the decimals below so that they are listed in numerical order from least to greatest.

34.039 32.94 34.198 32.162 33.6  
4 3 5 2 3

**Answer** 32.94 30.102 33.6 34.039 34.198  
Least \_\_\_\_\_ Greatest \_\_\_\_\_

The number 33.01 is added to the list so that the new list is still in numerical order. Between which two numbers should 33.01 be placed?

Answer Between 32.44 and 32.102

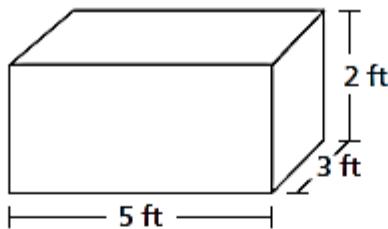
**Score Point 0 (out of 2 points)**

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The given values are not correctly ordered from least to greatest (32.94 and 32.102 are transposed) and the value of 33.01 does not fall between 32.94 and 32.102.

## EXEMPLARY RESPONSE

47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

*Show your work.*

$$5 \text{ ft} \times 3 \text{ ft} \times 2 \text{ ft} = 30 \text{ cubic feet}$$

$$30 \div \frac{1}{8} = 30 \times 8 = 240 \text{ cubes}$$

OR other valid response

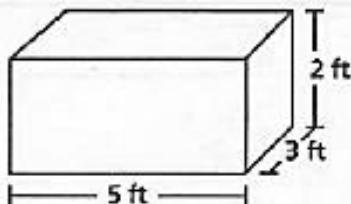
*Answer* \_\_\_\_\_ 240 wooden cubes

## GUIDE PAPER 1

Additional

47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.

① volume of box

$$V=L \times W \times H$$

$$V=5 \times 3 \times 2$$

$$V=15 \times 2$$

$$V=30 \text{ cu.ft.}$$

② volume of the box  
shown (in ft<sup>3</sup>)

$30 \div \frac{1}{8}$  = volume of 1 wooden box

$$\frac{30}{1} \div \frac{1}{8} = \frac{30}{1} \times \frac{8}{1} = \frac{240}{1}$$

③ check

$$\frac{240}{1} \times \frac{1}{8} = \frac{30}{1}$$

$$\frac{30}{8} \overline{)240} \\ 24 \\ 00$$

Answer 240 wooden cubes

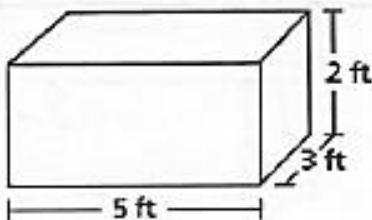
### Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. All multiplication and division is carried out appropriately and correctly to arrive at a correct solution.

## GUIDE PAPER 2

47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.

$$5 \times 3 = 15 \times 2 = \frac{30}{1} \div \frac{1}{8} = \frac{30 \times 8}{1} = 240$$

Answer 240 wooden cubes

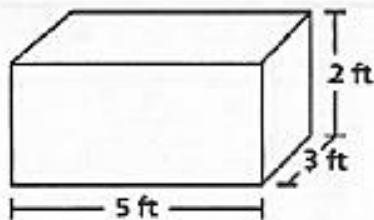
### Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. All multiplication and division is carried out appropriately and correctly to arrive at a correct solution.

## GUIDE PAPER 3

47

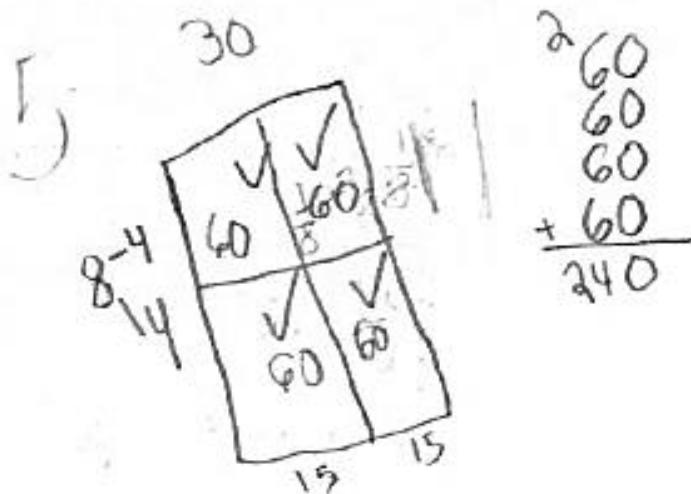
A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.

$$5 \times 3 = 15 \times 2 = 30$$



Answer 240 wooden cubes

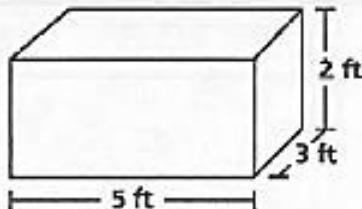
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. A visual representation of partial products is employed appropriately to arrive at a correct solution.

## GUIDE PAPER 4

47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.

$$\begin{array}{r} 1 \\ \times 15 \\ \hline 30 \end{array}$$

$$V=L \times w \times h$$

$$V=5 \times 3 \times 2$$

$$V=15 \times 2$$

$$V=30$$

$$\frac{1}{8} \times \frac{1}{30} = \frac{1}{240}$$

$$\begin{array}{r} 30 \\ \times 8 \\ \hline 240 \end{array}$$

Answer 240 wooden cubes

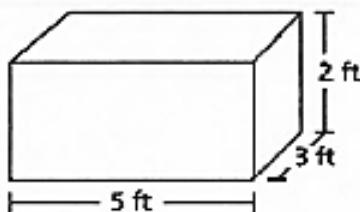
### Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct total volume is found; however, it is then inappropriately multiplied as  $\frac{1}{8} \times \frac{1}{30}$  rather than correctly dividing  $30 \div \frac{1}{8}$ , resulting in the reciprocal of the correct answer. The response correctly addresses only some elements of the task.

## GUIDE PAPER 5

47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.

$$5 \times 3 \times 2 = 30 \div 8 = 3 \frac{6 \div 2}{8 \div 2} = 3 \frac{3}{4}$$

Answer  $3\frac{3}{4}$  wooden cubes

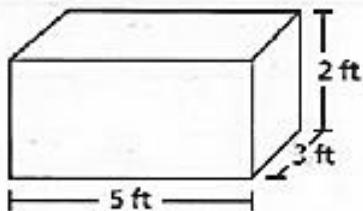
### Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct total volume is found; however, it is then inappropriately multiplied by  $\frac{1}{8}$  instead of dividing by  $\frac{1}{8}$ . The response correctly addresses only some elements of the task.

## GUIDE PAPER 6

47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.

$$V = l \times w \times h$$

$$V = 5 \text{ ft} \times 3 \text{ ft} \times 2 \text{ ft}$$

$$V = 15 \text{ ft}^2 \times 2$$

$$V = 30 \text{ ft}^3$$

Answer

30 ft<sup>3</sup> wooden cubes

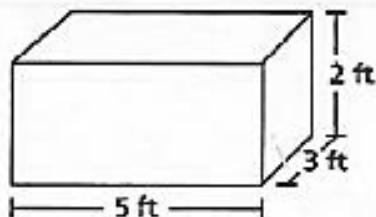
### Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct total volume is found; however, no attempt is made to solve how many wooden cubes will fit in that volume. The response correctly addresses only some elements of the task.

## GUIDE PAPER 7

47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.

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

$$3 \times \frac{1}{8} = \frac{3}{8}$$

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

$$\frac{15}{8} + \frac{3}{8} + \frac{2}{8} = \frac{10}{8}$$

$$\frac{1}{4}$$

$$\begin{array}{r} \cancel{1} \cancel{0} \\ - \cancel{8} \\ \hline 2 \end{array}$$

Answer 12 wooden cubes

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

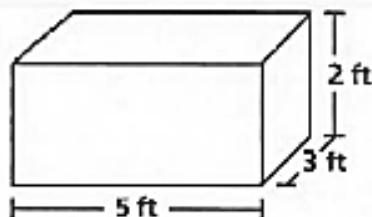
This response is irrelevant and does not demonstrate even a limited understanding of the mathematical concepts in the task. No attempt is made to determine the total volume of the package and  $\frac{1}{8}$  is inappropriately multiplied by the individual sides of the package.

## GUIDE PAPER 8

Additional

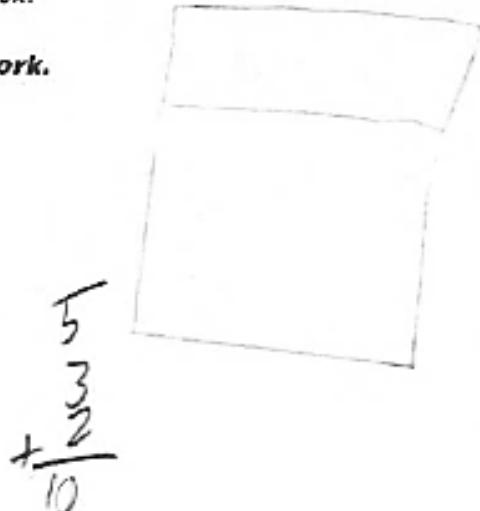
47

A toy company uses the box shown below to package wooden cubes.



Each wooden cube has a volume of  $\frac{1}{8}$  cubic foot. In total, how many wooden cubes will fit in the box?

Show your work.



Answer 10 ft wooden cubes

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

This response is irrelevant and does not demonstrate even a limited understanding of the mathematical concepts in the task. No attempt is made to determine the total volume of the package and the individual sides of the package are inappropriately added together.

## EXEMPLARY RESPONSE

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

*Show your work.*

$$6422 \div 26 = 247$$

$$\begin{array}{r} 247 \\ 26 ) 6422 \\ -52 \\ \hline 122 \\ -104 \\ \hline 182 \\ -182 \\ \hline 0 \end{array}$$

OR other valid response

*Answer* \_\_\_\_\_ 247 \_\_\_\_\_ CDs

# **GUIDE PAPER 1**

Additional

48

A library had 5,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.

### **Step 1.**

$$\begin{array}{r}
 & 247 \leftarrow \text{Amount of CDs in each shelf} \\
 26) 6422 \leftarrow \text{Total} \\
 & - 521 \quad \leftarrow \text{Amount} \\
 & \downarrow \quad \quad \quad \text{of CDs} \\
 & 1217 \\
 & - 104 \\
 \hline
 & 182 \\
 & - 162 \\
 \hline
 & 2
 \end{array}$$

Check

$$\begin{array}{r}
 \text{shelf} \quad 2^4 \\
 \text{amount} \quad \times 26 \quad \text{of CDs} \\
 \text{of CDs} \quad 1482 \quad \text{of shelves} \\
 \text{in each} \\
 \text{shelf} \\
 \hline
 499 \\
 6422 \\
 4 \\
 \text{Total amount} \\
 \text{of CDs}
 \end{array}$$

**Answer** 747 CO<sub>2</sub>

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of CDs is appropriately and correctly divided by the number of shelves.

## GUIDE PAPER 2

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.

$$\begin{array}{r} 247 \\ 26 \overline{)6,422} \\ 5200 \\ \hline 122 \\ -1040 \\ \hline 182 \\ -182 \\ \hline 0 \end{array}$$

~~$$\begin{array}{r} 3026 \\ \times 26 \\ \hline 182 \\ +2600 \\ \hline 5100 \end{array}$$~~

~~$$\begin{array}{r} 260 \\ \times 26 \\ \hline 1200 \\ +260 \\ \hline 5100 \end{array}$$~~

~~$$\begin{array}{r} 36 \\ \times 36 \\ \hline 130 \end{array}$$~~

~~$$\begin{array}{r} 261 \\ +152 \\ \hline 413 \end{array}$$~~

$$\begin{array}{r} 40 \\ \times 26 \\ \hline 16 \\ +240 \\ \hline 400 \\ +800 \\ \hline 1240 \\ -1040 \\ \hline 200 \\ -160 \\ \hline 40 \\ \times 26 \\ \hline 160 \\ +400 \\ \hline 560 \\ -520 \\ \hline 40 \\ \times 26 \\ \hline 160 \\ +400 \\ \hline 560 \\ -520 \\ \hline 40 \end{array}$$

~~$$\begin{array}{r} 90 \\ \times 26 \\ \hline 16 \\ +1540 \\ \hline 4140 \end{array}$$~~

~~$$\begin{array}{r} 70 \\ \times 26 \\ \hline 40 \\ +420 \\ \hline 490 \\ -490 \\ \hline 0 \end{array}$$~~

Answer 247 Os.

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of CDs is appropriately and correctly divided by the number of shelves.

## GUIDE PAPER 3

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.

$$\begin{array}{r} 247 \\ \overline{)6,422} \\ 52 \\ \hline 122 \\ 104 \\ \hline 182 \\ 182 \\ \hline 0 \end{array}$$

Answer 247 CDs

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of CDs is appropriately and correctly divided by the number of shelves.

# **GUIDE PAPER 4**

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.

**Answer** ✓ **Q5**

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of CDs is appropriately divided by the number of shelves; however, a calculation error results in an incorrect solution.

## GUIDE PAPER 5

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.

$$\begin{array}{r} 246 \\ 26 \overline{)6,422} \\ 52 \cancel{4} \\ \hline 122 \\ 104 \downarrow \\ \hline 182 \\ 156 \\ \hline 26 \\ - 26 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 3 \\ 26 \\ \times 2 \\ \hline 52 \\ \hline 156 \end{array}$$

$$\begin{array}{r} 3 \\ 26 \\ \times 5 \\ \hline 130 \end{array}$$

$$\begin{array}{r} 2 \\ 26 \\ \times 4 \\ \hline 104 \\ 26 \\ \times 7 \\ \hline 196 \end{array}$$

Answer 246 CDs

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of CDs is appropriately divided by the number of shelves; however, a calculation error results in an incorrect solution.

## GUIDE PAPER 6

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.

$$\begin{array}{r} \overrightarrow{547} \\ 26 \overline{)6,422} \\ 52 \downarrow \\ \hline 62 \\ -104 \\ \hline 182 \\ -182 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 203 \\ +176 \\ \hline 379 \\ \times 26 \\ \hline 182 \end{array}$$

$$\begin{array}{r} 326 \\ \times 6 \\ \hline 153 \\ \times 26 \\ \hline 182 \end{array}$$

Answer 547 CDs

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The number of CDs is appropriately divided by the number of shelves; however, a calculation error results in an incorrect solution.

## GUIDE PAPER 7

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.

$$\begin{array}{r} 6,422 \\ + 26 \\ \hline 6,448 \end{array}$$

Answer 6,448 CDs

**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 number of CDs is inappropriately added to the number of shelves.

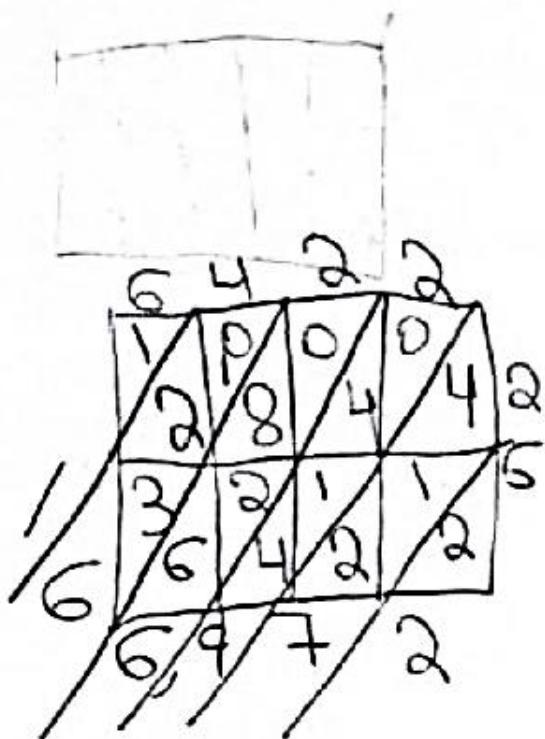
## GUIDE PAPER 8

Additional

48

A library had 6,422 music CDs stored on 26 shelves. If the same number of CDs were stored on each shelf, how many CDs were stored on each shelf?

Show your work.



Answer 16,972 CDs

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 number of CDs is inappropriately multiplied with the number of shelves.

## EXEMPLARY RESPONSE

49

Describe the relationship between  $n$  and 4 that will make the value of the expression  $7 \times \frac{n}{4}$  greater than 7.

*Answer*

n must be greater than four, in order for the fraction to be greater than one.

Seven must be multiplied by a number greater than one so that the answer is larger than itself.

Or other valid explanation

Describe the relationship between  $a$  and  $b$  that will make the value of the expression  $7 \times \frac{a}{b}$  equal to 7.

*Answer*

a and b must be equal, so that the fraction equals one. When seven is multiplied by one it will equal the answer seven.

Or other valid explanation

## GUIDE PAPER 1

Additional

49

Describe the relationship between  $n$  and 4 that will make the value of the expression

$$7 \times \frac{n}{4}$$
 greater than 7.

Answer

When the numerator is greater than the denominator the answer will be greater than 7 ( $n > 4$ ).

Describe the relationship between  $a$  and  $b$  that will make the value of the expression

$$7 \times \frac{a}{b}$$
 equal to 7.

Answer

for the answer to be equal to 7 the numerator and denominator have to be the same so they cancel out to 1 and any number multiplied by 1 will be that number

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The relationship between numerator and denominator required for the given conditions is correctly described for both expressions.

## GUIDE PAPER 2

49

Describe the relationship between  $n$  and 4 that will make the value of the expression  $7 \times \frac{n}{4}$  greater than 7.

**Answer**

Relationship between  $N$  and 4  
is  $N$  is greater than 4

Describe the relationship between  $a$  and  $b$  that will make the value of the expression  $7 \times \frac{a}{b}$  equal to 7.

**Answer**

Relationship here is  $B$  and  $A$   
are supposed to be the same

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The relationship between numerator and denominator required for the given conditions is correctly described for both expressions.

## GUIDE PAPER 3

49

Describe the relationship between  $n$  and 4 that will make the value of the expression

$$\frac{7}{7} \times \frac{n}{4}$$
 greater than 7.

**Answer**

The  $n$  has to be greater than 4.

Describe the relationship between  $a$  and  $b$  that will make the value of the expression

$$7 \times \frac{a}{b}$$
 equal to 7.

**Answer**

$\frac{7}{7} \times \left(\frac{1}{1}\right) = \frac{7}{7} = 7$      $7 \times \frac{4}{4} = 7$   
a and b have to be 1  
the same number.

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The relationship between numerator and denominator required for the given conditions is correctly described for both expressions.

## GUIDE PAPER 4

49

Describe the relationship between  $n$  and 4 that will make the value of the expression  $7 \times \frac{n}{4}$  greater than 7.

**Answer**

The relationship between  $n$  and 4 is that  $n$  is greater than 4.

Describe the relationship between  $a$  and  $b$  that will make the value of the expression  $7 \times \frac{a}{b}$  equal to 7.

**Answer**

The relationship between  $a$  and  $b$  is that  $b$  is greater than  $a$ .

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The relationship between  $n$  and 4 is correctly described; however, the relationship between  $a$  and  $b$  is incorrect.

## GUIDE PAPER 5

49

Describe the relationship between  $n$  and 4 that will make the value of the expression



$7 \times \frac{n}{4}$  greater than 7.

**Answer**

$$7 \times \frac{4}{4}(1) = 7$$

If you do  $n = ?$  then you have to do the  $\times$  and figure out what fits to make the answer correct. The correct answer is:  $n = 4$ !

$$7 \times \frac{4}{4} \text{ is really } 7 \times 1 \text{ and } 7 \times 1 = 7$$

Describe the relationship between  $a$  and  $b$  that will make the value of the expression

$7 \times \frac{a}{b}$  equal to 7.

**Answer**

A and  $b = 4$ , because  $\frac{4}{4}$  is 1 and  $7 \times 1$  is equal to 7. You didn't even have to do 4, you could of done any # as long as it was the same!

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The relationship between  $a$  and  $b$  being equal is correctly described; however, the relationship between  $n$  and 4 is incorrect.

## GUIDE PAPER 6

49

Describe the relationship between  $n$  and 4 that will make the value of the expression  $7 \times \frac{n}{4}$  greater than 7.

**Answer**

The  $N$  would be a 3, which  $7 \times \frac{3}{4}$  would be greater than 7.

Describe the relationship between  $a$  and  $b$  that will make the value of the expression  $7 \times \frac{a}{b}$  equal to 7.

$7 \times \frac{a}{b}$  equal to 7.

**Answer**

$A$  would be 1 and  $b$  would also be a 1.  $7 \times \frac{1}{1} = 7$ .

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The relationship between  $a$  and  $b$  being equal is correctly described; however, the relationship between  $n$  and 4 is incorrect. Note that although  $a$  and  $b$  are assigned the specific value of 1 even though they could be any value as long as they are equal, this error is considered inconsequential and does not detract from the response.

## GUIDE PAPER 7

49

Describe the relationship between  $n$  and 4 that will make the value of the expression  $7 \times \frac{n}{4}$  greater than 7.

*Answer*

Cause  $7 \times 4 = 28$  So 28 is greater than 7.

Describe the relationship between  $a$  and  $b$  that will make the value of the expression  $7 \times \frac{a}{b}$  equal to 7.

*Answer*

Cause  $a$  and  $b$  are not a number they have no value so 7 is equal to 7,

### 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 variable  $n$  is not addressed and the explanation for the second expression reflects a lack of understanding of variables.

## GUIDE PAPER 8

Additional

49

Describe the relationship between  $n$  and 4 that will make the value of the expression  $7 \times \frac{n}{4}$  greater than 7.

**Answer**

$n=1$  because  $7 \times \frac{1}{4}$  is  $7+4$  and  $7+4=28$  and 28 is greater than 7.

Describe the relationship between  $a$  and  $b$  that will make the value of the expression  $7 \times \frac{a}{b}$  equal to 7.

**Answer**

$b=1$  because  $7 \times 1=7$  and  $7=7$ . The relationship is that any number  $\checkmark$  multiplied by 1 = that number itself.  
Why  $b=1$

### 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 explanation for the first expression incorrectly equates  $7 \times \frac{1}{4}$  and  $7 \times 4$ . Although there is a correct explanation of the identity property of multiplying by 1 for the second expression, only  $b$  is set equal to 1: the variable  $a$  is not addressed.

## EXEMPLARY RESPONSE

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total		

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

**Show your work.**

Rosalva

$$1.5\text{km} = 1500\text{m}; 0.69\text{km} = 690\text{m}; 1.04\text{km} = 1040\text{m}; 2.1\text{km} = 2100\text{m}$$

$$1500 + 690 = 2190 \quad 2190 + 1040 = 3230 \quad 3230 + 2100 = 5330$$

Jake

$$1450 + 1590 = 3040 \quad 3040 + 1204 = 4244 \quad 4244 + 1977 = 6221$$

Difference

$$6221 - 5330 = 891$$

Or other valid process

**Answer** \_\_\_\_\_ 891 meters

**GUIDE PAPER 1**

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

**DISTANCE WALKED**

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total		

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

$$\begin{aligned}
 &\text{Rosalva} \\
 1.5 &= 1,500 \text{ m} \\
 0.69 &= 690 \text{ m} \\
 1.04 &= 1,040 \text{ m} \\
 2.1 &= 2,100 \text{ m} \\
 \\ 
 &\text{Total: } 5,330 \text{ m}
 \end{aligned}$$

$$\begin{array}{r}
 \text{Jake} \\
 \hline
 1,450 \\
 1,590 \\
 1,204 \\
 + 1,977 \\
 \hline
 6,221 \text{ m}
 \end{array}$$

$$\begin{array}{r}
 \text{Difference} \\
 \hline
 5,622 \\
 - 5,330 \\
 \hline
 891 \\
 \\ 
 5,330 \\
 + 891 \\
 \hline
 6,221 \text{ m}
 \end{array}$$

891 meters

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The distances in kilometers are correctly converted into meters, the total distance walked for each person is appropriately and correctly calculated, and the difference between them is found.

## GUIDE PAPER 2

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total	5.33	6,221

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

$$\begin{array}{r} 1.1 \\ 2.10 \\ 1.50 \\ 1.04 \\ \hline - 5.330 \\ \hline 891 \end{array} \qquad \begin{array}{r} 2.10 \\ 1.590 \\ 1.204 \\ 1.977 \\ \hline + 5.69 \\ \hline 6.221 \end{array}$$

Answer

891

meters

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The total distance walked for each person is appropriately and correctly calculated, kilometers are correctly converted into meters, and the difference between the two totals is found.

## GUIDE PAPER 3

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	21,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total	5.33	6,221

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

$$\begin{array}{r} \begin{array}{r} 11 \\ 5,112 \\ - 6,421 \\ \hline 891 \end{array} & \begin{array}{l} KHD, DCM \\ (B) \end{array} \\ - 5,330 & \begin{array}{r} 5.33 \\ 1 \text{ zero} \quad 53.3 \\ 2 \text{ zeros} \quad 533 \\ 3 \text{ zeros} \quad 5330 \end{array} \end{array}$$

Answer

891 meters

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The total distance walked for each person is appropriately and correctly calculated, kilometers are correctly converted into meters, and the difference between the two totals is found.

## GUIDE PAPER 4

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total	5.33	6,221

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

Rosalva	Jake
Mon 1.5	Mon 1,450
tues 0.69	tues 1,590
Wed 1.04	Wed 1,204
Thurs 2.1	Thurs 1,977
<hr/> 5.33	<hr/> 6,221

122

Answer

122

meters

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The total distance walked for each person is appropriately and correctly calculated; however, an incorrect solution of 122 meters is given with no support in the work for how that value was obtained. The response addresses only some elements of the task.

## GUIDE PAPER 5

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.500	1,450
Tuesday	0.690	1,590
Wednesday	1.040	1,204
Thursday	2.100	1,977
Total		

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

$$\begin{array}{r} 2,100 & 1,450 \\ 1,500 & 1,590 \\ 1,040 & 1,204 \\ \hline 690 & 1,977 \\ \hline 5,330 & 6,291 \end{array}$$

ANSWER

881

meters

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The total distance walked for each person is appropriately calculated, kilometers are correctly converted into meters, and the difference between the two totals is found; however, a calculation error occurs when determining the total distance walked by Jake (6,211), resulting in an incorrect solution. Although the solution is incorrect, appropriate procedures are applied.

## GUIDE PAPER 6

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total		

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

$$\begin{array}{r} 1.5 \\ + 0.69 \\ \hline 2.1 \\ + 1.04 \\ \hline 5.33 \end{array}$$

$$\begin{array}{r} 221 \\ 1450 \\ 1590 \\ + 1204 \\ \hline 6221 \end{array}$$

~~$$\begin{array}{r} 6221 \\ + 533 \\ \hline 62653 \end{array}$$~~  
$$\begin{array}{r} 533 \\ - 533 \\ \hline 0 \end{array}$$
  
$$\begin{array}{r} 6221 \\ - 533 \\ \hline 5688 \end{array}$$

Answer **5,688** meters

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The total distance walked for each person is appropriately and correctly calculated and the difference between the two totals is found; however, a calculation error occurs when converting kilometers into meters (533), resulting in an incorrect solution. Although the solution is incorrect, appropriate procedures are applied.

## GUIDE PAPER 7

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total	1.25	3,181

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

$$\begin{array}{r} 1.04 \\ + 2.1 \\ \hline 1.25 \end{array}$$

$$\begin{array}{r} 1,204 \\ 1,590 \\ \hline 4,1977 \end{array}$$

$$\begin{array}{r} 3,181 \\ + 1.25 \\ \hline 3,306 \end{array}$$

Answer 3,306 meters

### 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. Only two values from each column are added and those results are then inappropriately calculated.

## GUIDE PAPER 8

Additional

50

Rosalva and Jake walked a certain distance each day. They recorded the distances in the table shown below.

DISTANCE WALKED

	Rosalva (kilometers)	Jake (meters)
Monday	1.5	1,450
Tuesday	0.69	1,590
Wednesday	1.04	1,204
Thursday	2.1	1,977
Total		

What is the difference, in meters, between Rosalva's and Jake's total distances walked over the four days?

Show your work.

$$\begin{array}{r} 1450 \\ 1590 \\ 1204 \\ +1977 \\ \hline 6231 \end{array}$$

Meters

Answer

6.231

meters

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. Only the distances walked by Jake are added and a calculation error results in an incorrect solution.

## EXEMPLARY RESPONSE

51

Antoine wrote the expressions shown below.

- Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$
- Expression B:  $\square \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

***Show your work or explain how you determined this number.***

Only the number outside needs to be multiplied, so  
 $4 \times 8 = 32$

### ***Answer***

Since the only difference between Expression A and B is the unknown in

expression B, only the number outside of the brackets needs to be multiplied

by 8. Therefore the unknown number would be 32.

OR other valid explanation

# GUIDE PAPER 1

Additional

51

Antoine wrote the expressions shown below.

• Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

• Expression B:  $\square \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

Show your work or explain how you determined this number.

$$4 \times 8 = 32$$

#### Answer

I know that the box in expression B, is equal to 32. This is because expression B, is told to be eight times Expression A. So, all you have to do is take  $4 \times 8$ . This will equal 32.

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The correct solution is given and the explanation correctly identifies the need to only multiply the number outside of the brackets.

## GUIDE PAPER 2

51

Antoine wrote the expressions shown below.

• Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

• Expression B:  $\square \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

*Show your work or explain how you determined this number.*

*Answer*

32 because  $4 \times 8 = 32$  and in the problem

it said 8 times the value of Expression

A

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The correct solution is given and the explanation correctly identifies the need to only multiply the number outside of the brackets.

## GUIDE PAPER 3

51

Antoine wrote the expressions shown below.

\* Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

\* Expression B:  $\boxed{?} \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

*Show your work or explain how you determined this number.*

$$\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$$

**Answer**

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. While no verbal explanation is written, the work shown is sufficient to establish the need to only multiply the number outside of the brackets: the prompt only directed students to either show their work *OR* explain how they determined the number. Note that as per Scoring Policy #2, although the answer is not written in the answer blank it should still receive full credit.

## GUIDE PAPER 4

51

Antoine wrote the expressions shown below.

• Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

• Expression B:  $\square \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

*Show your work or explain how you determined this number.*

**Answer**

I think the number in  
the box will be 32. I'm  
determined this number is it  
because it said the value of  
expression B is 8 times the value of expression  
A.

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct solution of 32 is given; however, the explanation given is only a repetition of the prompt. The response correctly addresses only some elements of the task.

## GUIDE PAPER 5

51

Antoine wrote the expressions shown below.

• Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

• Expression B:  $\boxed{\phantom{00}} \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

Show your work or explain how you determined this number.

$$\begin{array}{r} 100.25 \\ + 1.50 \\ \hline 101.75 \end{array}$$

$$[(1.5 + 100.25) \times 3.65]$$

$$\begin{array}{r} [101.75] \\ \times 3.65 \\ \hline 371.3875 \\ 32 \\ \hline 7427750 \\ + 1021416250 \\ \hline 1028844000 \end{array}$$

$$\begin{array}{r} 101.75 \\ \times 3.65 \\ \hline 50875 \\ 610500 \\ + 3052500 \\ \hline 3713875 \end{array}$$

Answer

Times 4 by 8. Then do the math problem

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. A correct explanation is given of multiplying  $4 \times 8$ ; however, the product of 32 is never recorded. Additionally, the full expression is evaluated when the prompt directed not to do so. The response correctly addresses only some elements of the task.

## GUIDE PAPER 6

51

Antoine wrote the expressions shown below.

• Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

• Expression B:  $\square \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

Show your work or explain how you determined this number.

$$\begin{array}{r} 1.5 + 100.25 = 101.75 \\ \times 3.65 \\ \hline 508.75 \\ 1765.00 \\ \hline 365 - 281.00 \\ \hline 31,798.75 \end{array}$$

Answer

The determined number in Expression B is 32 because they have the same numbers except 1 number if 8 times greater than the other.

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

This response demonstrates only a partial understanding of the mathematical concepts in the task. The correct solution of 32 is given; however, the language in the explanation given is insufficient to distinguish it from a repetition of the prompt. Additionally, the full expression is evaluated when the prompt directed not to do so. The response correctly addresses only some elements of the task.

## GUIDE PAPER 7

51

Antoine wrote the expressions shown below.

• Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

• Expression B:  $\boxed{8} \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

*Show your work or explain how you determined this number.*

*Answer*

I determined this number  
because in the text it say  
that expression B was eight  
times the value the expression A.

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

This response is incorrect and does not demonstrate even a limited understanding of the mathematical concepts in the task. The value of 8 written does not take into account the value of 4 already existing in Expression A and the explanation given is only a repetition of the prompt.

## GUIDE PAPER 8

Additional

51

Antoine wrote the expressions shown below.

• Expression A:  $4 \times [(1.5 + 100.25) \times 3.65]$

• Expression B:  $\square \times [(1.5 + 100.25) \times 3.65]$

The value of Expression B is eight times the value of Expression A. Without evaluating Expression A, determine what number belongs in the box in Expression B. Explain how you determined this number.

Show your work or explain how you determined this number.

$$\begin{array}{r} 4 \times 8 \quad | \quad 155 \times 8 \quad | \quad 100.25 \times 8 \quad | \quad 3.65 \times 8 \\ 32 \quad | \quad 1240 \quad | \quad 124 \\ \quad \quad \quad + \quad 32 \\ \hline \quad \quad \quad 156 \end{array}$$

Answer:

I times "Expression A by 8"  
and then I added what I got.

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

This response is incorrect and does not demonstrate even a limited understanding of the mathematical concepts in the task. Although some elements of the work contain correct mathematical procedures ( $4 \times 8 = 32$ ), other values inside of the brackets were also inappropriately multiplied by 8 and the verbal explanation given is incorrect.

## EXEMPLARY RESPONSE

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action," and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{9}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because he did not find a common denominator to add the

fractions. He just added the numerators and denominators as they are, he

should have gotten  $\frac{17}{20}$ .

OR other valid explanation

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

*Show your work.*

$$\frac{3}{5} + \frac{1}{4} = \frac{12}{20} + \frac{5}{20} = \frac{17}{20}$$

$$1 - \frac{17}{20} = \frac{20}{20} - \frac{17}{20} = \frac{3}{20}$$

OR other valid response

*Answer* \_\_\_\_\_  $\frac{3}{20}$

## GUIDE PAPER 1

Additional

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because he added the two fractions incorrectly. He is supposed to find a common denominator for 5 and 4 which is 20. Then he has to multiply the numerator 3 by 4 and 1 by 5. Then what fraction of the DVDs in Andy's collection is not "Action" or "Comedy"? he adds.

Show your work.

His answer should be

$$\frac{3}{5} + \frac{1}{4} = 0$$

$$\frac{12}{20} + \frac{5}{20} = \frac{17}{20}$$

$$\frac{20}{20} - \frac{17}{20} = \frac{3}{20}$$

$$\frac{17}{20}$$

Answer  $\frac{3}{20}$  ✓

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The explanation correctly identifies Andy's error and the fraction of the DVD collection that is not "Action" or "Comedy" is correctly calculated.

## GUIDE PAPER 2

52

Andy has a collection of movie DVDs. In Andy's collection,

$$\frac{12}{20} + \frac{5}{20} = \frac{17}{20}$$

=  $\frac{3}{5}$  of the DVDs are "Action" and  
=  $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect. He is incorrect because instead of finding a common denominator, he added the denominator 5, with the denominator 4, to get 9. And what fraction of the DVDs in Andy's collection is not "Action" or "Comedy"? Add the numerator 3, to the numerator 1, to get  $\frac{4}{9}$ .

$$\frac{12+5}{20} = \frac{17}{20}$$

$$\frac{20}{20} - \frac{17}{20}$$

Answer 50

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The explanation correctly identifies Andy's error and the fraction of the DVD collection that is not "Action" or "Comedy" is correctly calculated.

## GUIDE PAPER 3

52

Andy has a collection of movie DVDs. In Andy's collection,

\*  $\frac{3}{5}$  of the DVDs are "Action" and

\*  $\frac{1}{4}$  of the DVDs are "Comedy."

$$\frac{12}{20} + \frac{5}{20} = \frac{17}{20}$$

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because  $\frac{3}{5} + \frac{1}{4} = \frac{17}{20}$ .

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\begin{array}{r} 20 \\ - 17 \\ \hline 3 \end{array}$$
  
$$\frac{3}{20}$$

Answer  $\frac{3}{20}$

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The explanation correctly identifies Andy's error and the fraction of the DVD collection that is not "Action" or "Comedy" is correctly calculated. Note that although some of the work shown is not in the designated "Show your work" area, as per Scoring Policy #1, it should still be scored.

## GUIDE PAPER 4

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because  $\frac{3}{5} + \frac{1}{4}$  doesn't equal  $\frac{4}{5}$ .

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\begin{array}{r} \frac{3}{5} = \frac{12}{20} \\ \frac{1}{4} = \frac{5}{20} \\ \hline \end{array}$$
$$\begin{array}{r} 12 \\ 5 \\ \hline 17 \\ 20 \end{array}$$

Answer 17/20

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

This response demonstrates a partial understanding of the mathematical concepts in the task. The explanation correctly identifies that Andy made an error but does not sufficiently explain why it was incorrect. However, the fraction of the DVD collection that is not "Action" or "Comedy" is correctly calculated. The response correctly addresses most, but not all, aspects of the task.

## GUIDE PAPER 5

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because  
he is supposed to find  
a common multiple of 4, 5

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\begin{array}{r} 12 \\ \hline 20 \\ \hline 5 \end{array}$$

Answer  $\frac{3}{20}$

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

This response demonstrates a partial understanding of the mathematical concepts in the task. The explanation correctly identifies Andy's error and the fraction of the DVD collection that is not "Action" or "Comedy" is correctly calculated. However, the required work is limited:  $\frac{3}{5}$  and  $\frac{1}{4}$  are correctly given a common denominator, but their summation is not shown.

## GUIDE PAPER 6

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because Andy added the denominators which never change. He needs to find the common denominator.

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\begin{array}{r} \text{5: } 5 \cancel{10} \cancel{15} \cancel{20} \quad \frac{3}{5} \rightarrow \frac{12}{20} \\ + \quad \text{4: } 4 \cancel{8} \cancel{12} \cancel{16} \quad \frac{1}{4} \rightarrow \frac{5}{20} \\ \hline \end{array}$$

$\frac{17}{20}$

Answer 17/20

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

This response demonstrates a partial understanding of the mathematical concepts in the task. The explanation correctly identifies Andy's error; however, although  $\frac{3}{5}$  and  $\frac{1}{4}$  are correctly given a common denominator and calculated to  $\frac{17}{20}$ , no attempt is made to subtract this value from 1, resulting in an incorrect solution. The response correctly addresses most, but not all, aspects of the task.

## GUIDE PAPER 7

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy's error is that the two denominators are both not the same. You have to do LCM to subtract right.

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\frac{3}{5} + \frac{1}{4} \times 5$$

$$\begin{array}{r} 5: 5 \quad 10 \quad 15 \quad 20 \\ 4: 4 \quad 8 \quad 12 \quad 16 \end{array} \text{ (20)}$$

$$\frac{4}{20} + \frac{5}{20} = \frac{9}{20}$$

$$\frac{9}{20}$$

$$\frac{4}{20} + \frac{5}{20} - \frac{9}{20}$$

Answer  $\frac{9}{20}$

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. The explanation correctly identifies Andy's error; however, although the response determines the correct common denominator of 20, the numerators are not correctly addressed and no attempt is made to subtract the sum of  $\frac{9}{20}$  from 1. The response reflects a lack of essential understanding of the underlying concepts.

## GUIDE PAPER 8

Additional

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because  $\frac{4}{5}$  is not equivalent to  $\frac{3}{5}$  or  $\frac{1}{4}$ , which are "Action" and "Comedy."

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\frac{\frac{3}{5} \times 4}{5} = \frac{12}{20} \quad \frac{1}{4} = \frac{5}{20} \quad \frac{12}{20} + \frac{5}{20} = \frac{17}{20}$$

Answer  $\frac{17}{20}$

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. The fraction of DVDs that are "Action" or "Comedy" is correctly calculated; however, no attempt is made to subtract that value from 1 to determine the fraction of DVDs not in those genres, and the explanation does not correctly identify Andy's error. The response correctly addresses only some elements of the task.

## GUIDE PAPER 9

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{9}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is incorrect because he just added the numerator and the denominator. But you have to find the common denominator. Then add.

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

?

Answer     ?

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. The explanation correctly identifies Andy's error; however, the second question of the problem is not addressed. The response correctly addresses only some elements of the task.

## GUIDE PAPER 10

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{5}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

he is ~~correct~~ because  $\frac{3}{5}$  are action and  $\frac{1}{4}$  are Comedy and that added together is  $\frac{4}{5}$

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\frac{1}{4} \times \frac{3}{5} = \frac{3}{20} = \frac{3}{20}$$

$$\frac{3}{2}$$

Answer \_\_\_\_\_

### 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 explanation incorrectly asserts that Andy made no errors. Although the correct solution of  $\frac{3}{20}$  is present in the work, it is obtained through an obviously incorrect multiplication procedure.

## GUIDE PAPER 11

Additional

52

Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$  of the DVDs are "Action" and
- $\frac{1}{4}$  of the DVDs are "Comedy."

Andy said that  $\frac{4}{9}$  of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

Andy is correct because he added  $\frac{4}{9}$  which are comedy so if you add you get  $\frac{4}{9}$ . He added wrong.

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy"?

Show your work.

$$\frac{1}{4}$$

$$\frac{4}{9} - \frac{3}{5} = \frac{1}{4}$$

Answer  $\frac{1}{4}$

### 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 explanation given does not sufficiently identify Andy's error, and the given values are inappropriately and incorrectly subtracted when determining the solution.

## EXEMPLARY RESPONSE

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

*Show your work.*

$$12.5 \div 2.5 = 5 \text{ dog beds}$$

$$\$17.50 \times 5 = \$87.50 \text{ made}$$

$$12.5 \times \$4.50 = \$56.25 \text{ cost of fabric}$$

$$\$87.50 - \$56.25 = \$31.25 \text{ profit}$$

OR other valid response

*Answer* \$ 31.25

## GUIDE PAPER 1

Additional

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} 12.5 \\ \times 4.50 \\ \hline 6250 \\ + 50000 \\ \hline \$56.250 \end{array}$$

Cost of  
Fabric

$$\begin{array}{r} 25 \longdiv{125} \\ \quad 5 \\ \quad - 25 \\ \quad \quad 0 \end{array}$$

Dog Beds  
Amount

$$\begin{array}{r} 32 \\ 17.50 \\ \times 5 \\ \hline \$87.50 \end{array}$$

Money made  
from selling  
dog beds

$$\begin{array}{r} 4.50 \quad 17.50 \quad 2.5 \longdiv{125} \\ \times 12.5 \quad \times 5 \quad 5 \\ \hline 2250 \quad 87.50 \quad 25 \longdiv{125} \\ 9000 \quad - \quad \quad \quad 25 \\ \hline + 15000 \quad \quad \quad \quad 0 \\ \hline 56.250 \quad \quad \quad \quad 31.25 \end{array}$$

Check

$$\begin{array}{r} 4.50 \\ \times 12.5 \\ \hline 87.50 \\ - 56.25 \\ \hline 31.25 \end{array}$$

Profit

Answer \$ 31.25

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The total cost of fabric, number of beds to be made, and total sales revenue are all appropriately and correctly calculated and well-labeled and used to determine the net profit.

## GUIDE PAPER 2

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

The student has handwritten their work in three main sections:

- Top Left:** A multiplication problem showing \$4.50 multiplied by 12. The student has written the problem vertically and calculated the result as \$54.00, which is then crossed out and replaced by \$56.25.
- Top Right:** A subtraction problem showing \$84.50 minus 24. The student has written the problem vertically and calculated the result as \$60.50, which is then crossed out and replaced by \$60.00.
- Bottom:** A series of calculations showing the division of 12.5 by 2.5, resulting in 5. This is then multiplied by \$17.50 to get \$87.50, and finally \$87.50 minus \$56.25 to get \$31.25.

Answer \$31.25 was her profit

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The total cost of fabric, number of beds to be made, and total sales revenue are all appropriately and correctly calculated and used to determine the net profit.

## GUIDE PAPER 3

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} 4.50 \\ \times 12.5 \\ \hline 225 \\ 450 \\ \hline 56.25 \end{array}$$

$$\begin{array}{r} 2.5 \sqrt{12.5} \\ \quad \quad \quad 5 \\ \quad \quad \quad 2.5 \\ \hline \quad \quad \quad 10 \\ \quad \quad \quad - 5 \\ \hline \quad \quad \quad 5 \\ \quad \quad \quad - 5 \\ \hline \quad \quad \quad 5 \end{array}$$

$$54.00 + 2.25 = \$56.25$$

$$\begin{array}{r} 17.50 \\ \times 3.25 \\ \hline 87.50 \\ 525 \\ \hline 56.25 \end{array}$$

$$\begin{array}{r} 87.50 \\ - 56.25 \\ \hline 31.25 \end{array}$$

Answer \$ 31.25

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The total cost of fabric, number of beds to be made, and total sales revenue are all appropriately and correctly calculated and used to determine the net profit.

## GUIDE PAPER 4

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} 12.5 \\ \times 4.50 \\ \hline 62.50 \\ + 50.000 \\ \hline 56.250 \end{array}$$

$$\begin{array}{r} 17.50 \\ \times 4 \\ \hline 70.00 \end{array} \quad \begin{array}{r} 2.5 \\ 2.5 \\ 2.5 \\ 2.5 \\ \hline 12.0 \end{array} \quad 4 \text{ dog beds}$$
$$\begin{array}{r} 70.00 \\ - 56.25 \\ \hline 23.75 \end{array}$$

Answer \$

\$ 23.75

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

This response demonstrates a partial understanding of the mathematical concepts in the task. The total cost of fabric and total sales revenue are appropriately calculated and used to determine the net profit; however, a calculation error when solving for the number of beds to be made ( $2.5 + \dots = 12.0$ , 4 dog beds) results in an incorrect solution. Although the solution is incorrect, appropriate procedures are applied.

## GUIDE PAPER 5

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

fabric - 12.5 yards = \$4.50

2.5 - each dog

$$2.5 \overline{)12.5}$$

$$\begin{array}{r} 3 \\ 17.50 \\ \times 5 \\ \hline 87.50 \\ - 4.50 \\ \hline 83.00 \end{array}$$

Answer \$83.00

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

This response demonstrates a partial understanding of the mathematical concepts in the task. The number of beds to be made and the total sales revenue are appropriately and correctly calculated; however, the solution incorrectly subtracts only the cost of a single yard of fabric ( $\$87.50 - \$4.50 = \$83.00$ ). The response correctly addresses most, but not all, aspects of the task.

## GUIDE PAPER 6

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} 12.50 \\ \times \$4.50 \\ \hline 0000 \\ 62500 \\ \hline 56.2500 \end{array}$$

$$\begin{array}{r} 25)12.5 \\ \quad \quad \quad 5 \\ \quad \quad \quad 125 \\ \quad \quad \quad \quad 0 \\ \times \quad \quad \quad 32 \\ \hline \quad \quad \quad 5 \\ \hline \$87.50 \end{array}$$

Answer \$ 87.50

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

This response demonstrates a partial understanding of the mathematical concepts in the task. The total cost of fabric, number of beds to be made, and the total sales revenue are all appropriately and correctly calculated; however, no attempt is made to subtract the cost of the fabric from the revenue. The response addresses most, but not all, aspects of the task.

## GUIDE PAPER 7

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} 12.5 \\ - 2.5 \\ \hline 10.0 \\ - 2.5 \\ \hline 7.5 \\ - 2.5 \\ \hline 5.0 \\ - 2.5 \\ \hline 2.5 \\ - 2.5 \\ \hline 0.0 \end{array}$$

$$\begin{array}{r} \$17.50 \\ \times 5 \\ \hline 87.50 \end{array}$$

Answer \$ 87.50

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. The number of beds to be made and the total sales revenue are appropriately and correctly calculated; however, no attempt is made to calculate the total cost of fabric or to subtract any initial costs from the revenue to determine the net profit. The response addresses some elements of the task correctly, but is incomplete.

## GUIDE PAPER 8

Additional

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} \overset{1}{\cancel{1}} \overset{2}{\cancel{2}} \overset{5}{\cancel{5}} \\ \times 45 \\ \hline 000 \\ 6250 \\ + 50000 \\ \hline \cancel{\$56.250} \end{array} \quad \begin{array}{r} \$17.50 \\ \times 2.5 \\ \hline 18750 \\ 13500 \\ \hline \$43.750 \end{array}$$

$$\begin{array}{r} 56.125 \\ - 43.75 \\ \hline \$12.50 \end{array}$$

Answer \$

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. The total cost of fabric is correctly calculated; however, the value of 2.5 is misinterpreted as the number of beds to be made and inappropriately multiplied by \$17.50 resulting in an incorrect value for total sales revenue. Additionally, although the difference between revenue and the cost of fabric is found, the subtraction is performed in the incorrect order. The response exhibits multiple flaws related to misunderstanding of important aspects of the task.

## GUIDE PAPER 9

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} 25 \overline{)125} \\ -125 \\ \hline 0 \\ \times 17.50 \\ \hline 175.00 \\ -4.50 \\ \hline 170.50 \end{array}$$

Answer \$ 4170.50

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. 12.5 is appropriately divided by 2.5 to solve for the number of beds to be made; however, a calculation error leads to an incorrect result. 10 is then correctly multiplied by 17.50 to determine the total sales revenue; however, only the cost of a single yard of fabric is subtracted from this value to determine the net profit. The response exhibits multiple flaws related to misunderstanding of important aspects of the task.

## GUIDE PAPER 10

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} \times \text{XXX} \\ 4.50 \end{array} \quad \begin{array}{r} 14.50 \\ + 4.50 \\ \hline 2.5 = 1 \text{ db} \end{array}$$
$$1450 \quad | = 4.50 \quad 2.5 = \$11.25$$
$$\times 3 \quad 2 = 15.00$$
$$\hline 1350 \quad 3 = 2.1$$
$$\begin{array}{r} \$2.25 \\ \hline 450 \end{array} \quad 4 = 1.1$$
$$\begin{array}{r} 450 \\ - 400 \\ \hline 50 \end{array} \quad 5 = M$$
$$\begin{array}{r} 50 \\ - 40 \\ \hline 10 \end{array} \quad 6 = E$$
$$\begin{array}{r} 10 \\ - 9 \\ \hline 1 \end{array} \quad 7 = 1$$
$$\begin{array}{r} 1 \\ - 1 \\ \hline 0 \end{array} \quad 8 = 0$$
$$\begin{array}{r} 0 \\ - 0 \\ \hline 0 \end{array} \quad 9 = 1$$
$$\begin{array}{r} 0 \\ - 0 \\ \hline 0 \end{array} \quad 10 = 1$$
$$\begin{array}{r} 0 \\ - 0 \\ \hline 0 \end{array} \quad 11 = 1$$
$$\begin{array}{r} 0 \\ - 0 \\ \hline 0 \end{array} \quad 12 = 1$$
$$\begin{array}{r} 4.50 \\ \times 12 \\ \hline 900 \\ 4500 \\ \hline 54.00 \\ + 2.25 \\ \hline 56.25 \end{array}$$

Answer \$

56.25

Score Point 0 (out of 3 points)

Although some elements contain correct procedures ( $2.5 = \$11.25$ , which is the correct cost of a single dog bed using 2.5 yards of fabric), multiple other unrelated or inappropriate calculations are shown ( $450 \times 3$ ,  $12.50 \div 4.50$ , etc.). Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

## GUIDE PAPER 11

Additional

53

Molly bought 12.5 yards of fabric for \$4.50 a yard to make dog beds. She uses 2.5 yards of fabric for each dog bed. She sells each dog bed for \$17.50. After subtracting the cost of the fabric, how much money does Molly earn if she sells all of the dog beds?

Show your work.

$$\begin{array}{r} 5 \\ \sqrt{12.5} \\ \underline{\quad} \\ \$4.50 \end{array}$$

$$\begin{array}{r} 5 \\ 25 \sqrt{125} \\ \underline{-125} \\ 0 \\ \begin{array}{r} 11.50 \\ +4.50 \\ \hline 16.00 \\ -15.00 \\ \hline 1.00 \end{array} \end{array}$$

Answer \$ 17.00

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

Although some elements contain correct procedures ( $125 \div 25 = 5$  as a proxy for  $12.5 \div 2.5$ ), the cost of a single yard of fabric is inappropriately added to the sale price of a single dog bed. The value of 5 is then misinterpreted as a dollar amount and inappropriately subtracted from the previous sum. Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

## EXEMPLARY RESPONSE

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

*Show your work.*

Cycling:  $12\frac{1}{2}$  miles

Running:  $12\frac{1}{2} \times \frac{1}{4} = 3\frac{1}{8}$  miles

Kayaking:  $3\frac{1}{8} \times \frac{1}{2} = 1\frac{9}{16}$  miles

Total:

$$12\frac{1}{2} + 3\frac{1}{8} + 1\frac{9}{16}$$

$$= 12\frac{8}{16} + 3\frac{2}{16} + 1\frac{9}{16}$$

$$= 16\frac{19}{16}$$

$$= 17\frac{3}{16}$$

OR other valid response

*Answer*  $17\frac{3}{16}$  miles

## GUIDE PAPER 1

Additional

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$12\frac{1}{2} = \frac{25}{2}$$

$$\frac{25}{2} \times \frac{1}{4} = \frac{25}{8} = 3\frac{1}{8}$$

$$\frac{25}{8} \times \frac{1}{2} = \frac{25}{16} = 1\frac{9}{16}$$

$$\frac{25}{8} = \frac{50}{16} \quad \frac{50}{16} + \frac{200}{16} = \frac{250}{16} + \frac{25}{16} = 17\frac{3}{16}$$

$$\frac{25}{2} = \frac{200}{16}$$

$$\frac{25}{16} - \frac{25}{16} = 0$$

$$\begin{array}{r} 0.375 \\ 8 \overline{) 2.5 } \\ -24 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 0.125 \\ 16 \overline{) 2.5 } \\ -16 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 0.1736 \\ 16 \overline{) 2.736 } \\ -16 \\ \hline 1136 \\ -112 \\ \hline 16 \\ \times 7 \\ \hline 112 \end{array}$$

Answer  $17\frac{3}{16}$  miles

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. Appropriate and correct multiplication of fractions is used to determine the distances of each part of the race, which are then correctly added to determine the total distance of the race.

## GUIDE PAPER 2

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$\begin{array}{r} 12.5 \\ 3.125 \\ + 1.5625 \\ \hline 17.1875 \end{array}$$
$$\begin{array}{r} 1.5625 \\ \times 2 \\ \hline 3.1250 \end{array}$$
$$\begin{array}{r} 3.1250 \\ \times 0.5 \\ \hline 1.5625 \end{array}$$
$$\begin{array}{r} 17.1875 \\ - 15.0000 \\ \hline 2.1875 \end{array}$$
$$\begin{array}{r} 2.1875 \\ \times 0.5 \\ \hline 1.09375 \end{array}$$
$$\begin{array}{r} 1.09375 \\ + 1.09375 \\ \hline 2.1875 \end{array}$$

Answer 17.1875 miles

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. The value  $12\frac{1}{2}$  is correctly converted into a decimal format before dividing to determine the distances of each part of the race, which are then correctly added to determine the total distance of the race.

## GUIDE PAPER 3

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

1) <u>Cycling</u> $12\frac{1}{2}$ miles	2) <u>Running</u> $12\frac{1}{2} \times \frac{1}{4}$	3) <u>Kayaking</u> $3\frac{1}{8} \times \frac{1}{2}$
<u>4) Whole Race</u> $12\frac{1}{2} + 3\frac{1}{8} + 1\frac{9}{16}$ Cycling + Running + Kayaking $12\frac{8}{16} + 3\frac{2}{16} + 1\frac{9}{16} =$ $16\frac{9}{16} = 17\frac{3}{16}$	$12\frac{1}{2} \times \frac{1}{4} = \frac{25}{2} \times \frac{1}{4} = \frac{25}{8}$ $\frac{25}{8} : 3\frac{1}{8} =$ $3\frac{1}{8}$ miles	$3\frac{1}{8} \times \frac{1}{2} = \frac{25}{8} \times \frac{1}{2} = \frac{25}{16}$ $\frac{25}{16} = 1\frac{9}{16}$ $\frac{9}{16}$ miles
<u>5) Check</u> $17\frac{3}{16}$ miles <u>6) Check</u> $17\frac{3}{16}$ miles	$3\frac{1}{8} \times \frac{1}{4} = \frac{25}{8} \times \frac{1}{4} = \frac{25}{32}$ $= 3\frac{2}{16}$ $= \frac{25}{16} \times \frac{1}{2} = \frac{25}{32} = 1\frac{9}{16}$	$1\frac{9}{16} + 2\frac{1}{2} = 3\frac{1}{8}$ $2$ miles

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

This response demonstrates a thorough understanding of the mathematical concepts in the task. Appropriate and correct multiplication of fractions is used to determine the distances of each part of the race, which are then correctly added to determine the total distance of the race.

## GUIDE PAPER 4

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$12\frac{1}{2} \times \frac{1}{4} = \frac{25}{2} \times \frac{1}{4} = \frac{25}{8} = 3\frac{1}{8}$$

~~$12\frac{1}{2} \times \frac{1}{4} = \frac{25}{2} \times \frac{1}{4} = \frac{25}{8} = 3\frac{1}{8}$~~

$$3\frac{1}{8} \times \frac{1}{2} = \frac{25}{8} \times \frac{1}{2} = \frac{25}{16} = 1\frac{9}{16}$$

$$2\frac{1}{2} + 3\frac{1}{8} + 1\frac{9}{16} = \\ 2\frac{8}{16} + 3\frac{2}{16} + 1\frac{9}{16} = 6\frac{19}{16} = 7\frac{3}{16}$$

Answer  $7\frac{3}{16}$  miles

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

This response demonstrates a partial understanding of the mathematical concepts in the task. Appropriate and correct multiplication of fractions is used to determine the distances of each part of the race; however, when adding the distances to determine the total distance,  $12\frac{1}{2}$  is incorrectly transcribed as  $2\frac{1}{2}$ , an error which is carried through the calculation resulting in an incorrect solution. Although the solution is incorrect, appropriate procedures are applied.

## GUIDE PAPER 5

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

$$\frac{1}{2} \text{ of } 3 = 1.5$$

$$\frac{1}{4} \text{ of } 12 = \frac{1}{8} \text{ or } 1.5$$

Show your work.

$$3\frac{1}{4}$$
  
1.5

$$\frac{1}{4} \text{ of } 12 = 3$$
  
$$\frac{1}{2} \text{ of } 3 = 1.5$$

$$1.5 + 3 + 1.5 = 6$$
  
$$1.5$$
  
$$3$$
  
$$1.5$$
  
$$6$$

Answer

16.25 miles

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

This response demonstrates a partial understanding of the mathematical concepts in the task. Appropriate multiplication of fractions is used to determine the distances of each part of the race, which are then correctly added to determine the total distance of the race; however a calculation error occurs when determining the fractional component of the running part of the race ( $\frac{1}{4}$  of  $\frac{2}{4}$  =  $\frac{1}{4}$ ), and this error is carried through the rest of the work with no further mistakes. The response correctly addresses most, but not all, aspects of the task.

## GUIDE PAPER 6

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$\left( \begin{array}{c} 12 \\ + \\ 1 \\ \hline 12 \end{array} \right) \times \frac{1}{4} = \frac{25}{8}$$

$$\frac{25}{8} \times \frac{1}{2} = \frac{25}{16} = \boxed{\frac{9}{16}}$$

$$\begin{array}{r} 16 \\ + 16 \\ \hline 32 \end{array} \quad \begin{array}{r} 25 \\ - 16 \\ \hline 9 \end{array}$$

Answer  $1\frac{9}{16}$  miles

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

This response demonstrates a partial understanding of the mathematical concepts in the task. Appropriate and correct multiplication of fractions is used to determine the distances of each part of the race; however, no attempt is made to add the parts together to solve for the entire distance. The response addresses most, but not all, aspects of the task.

## GUIDE PAPER 7

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$3\frac{1}{8} = \text{running}$$

$$1\frac{9}{16} = \text{kayaking}$$

Answer  $17\frac{3}{16}$  miles

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. Although the solution is correct, the required work is limited. The correct distances of the running and kayaking portions of the race are listed, but no operations are shown to support how either they or the solution were obtained.

# **GUIDE PAPER 8**

## Additional

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

**Show your work.**

$$12\frac{1}{2} \quad \frac{1}{4}$$

• 100 •

$\frac{a}{b}$  miles

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. An appropriate and correct multiplication is shown to calculate the distance of the kayaking portion of the race; however, the running portion of the race is not addressed and no attempt is made to add the portions together to determine a total distance. The response addresses some elements of the task, but is incomplete.

## GUIDE PAPER 9

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$12\frac{1}{2} \div \frac{1}{4} = 3$$
$$3 \div \frac{1}{2} = 1\frac{1}{2}$$

$$\begin{array}{r} 1 \\ 12\frac{1}{2} \\ \hline 3 \\ + 1\frac{1}{2} \\ \hline 17 \end{array}$$

Answer 17 miles

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

This response demonstrates only a limited understanding of the mathematical concepts in the task. Although the distances of each portion of the race are correctly calculated, the multiplication to solve for the individual portions is inappropriately written using a division symbol ( $3 \div \frac{1}{2} = 1\frac{1}{2}$ ), and a calculation error occurs when solving the distance of the running portion ( $12\frac{1}{2} \div \frac{1}{4} = 3$ ). The response exhibits multiple flaws related to misunderstanding of important aspects of the task and misuse of mathematical procedures.

## GUIDE PAPER 10

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$12\frac{1}{2} + \frac{1}{4} + \frac{1}{2} =$$

$$\begin{aligned} & 12\frac{1}{2} \\ & \frac{25}{2} + \frac{1}{4} + \frac{1}{2} = \frac{27}{8} \\ & \quad \text{---} \\ & \quad \text{---} \end{aligned}$$

$\frac{27}{8}$   $\boxed{3\frac{3}{8}}$

Answer  $3\frac{3}{8}$  miles

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.  $\frac{1}{2}$  and  $\frac{1}{4}$  are misinterpreted as distances rather than ratios, and the three given values are inappropriately and incorrectly calculated.

## GUIDE PAPER 11

Additional

54

In a race that consisted of three parts, the cycling part was  $12\frac{1}{2}$  miles long. The running part of the race was  $\frac{1}{4}$  the distance of the cycling part. The kayaking part of the race was  $\frac{1}{2}$  the distance of the running part. What was the entire distance, in miles, of the race?

Show your work.

$$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

$$12\frac{1}{2} + \frac{1}{4} = 12\frac{3}{4}$$

$$12\frac{6}{8} + \frac{1}{8} = 12\frac{7}{8}$$

Answer  $12\frac{7}{8}$  miles

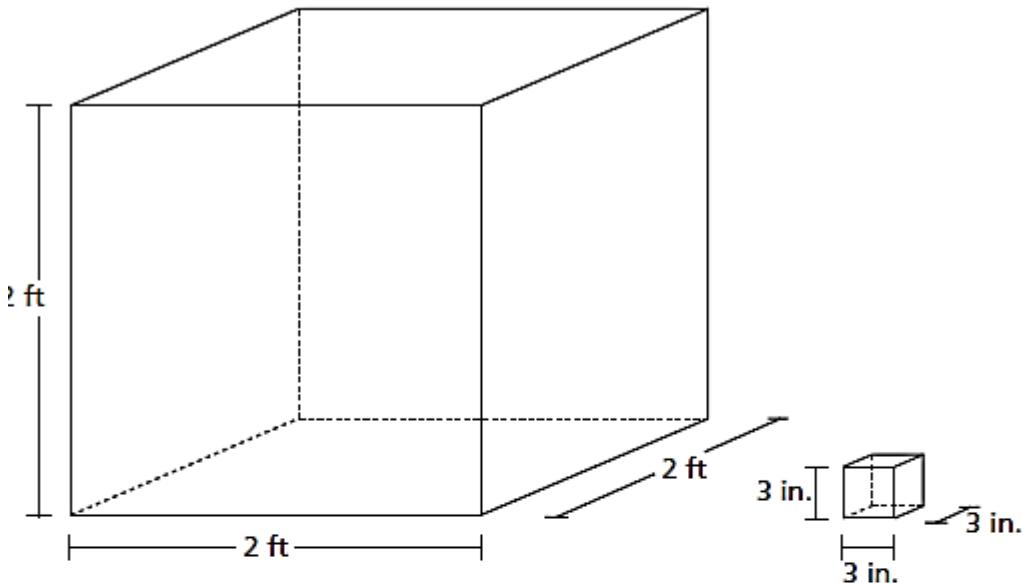
### Score Point 0 (out of 3 points)

Although  $\frac{1}{4}$  is appropriately multiplied by  $\frac{1}{2}$  to solve for the distance of the kayaking portion of the race and the three distances are correctly calculated to determine a total,  $\frac{1}{4}$  is misinterpreted as the distance of the running portion of the race, rather than a ratio comparing it to the cycling portion. Although some elements contain correct procedures, holistically this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task.

## EXEMPLARY RESPONSE

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

**Show your work.**

$$2 \text{ feet} = 24 \text{ inches}$$

$$\begin{aligned}\text{Volume of crate: } & 24^3 = 24 \times 24 \times 24 = 576 \times 24 \\ & = 13,824\end{aligned}$$

$$24 \div 3 = 8 \text{ boxes per row}$$

$$\text{Volume of lotion box: } 3^3 = 3 \times 3 \times 3 = 9 \times 3 = 27$$

$$8^3 = 8 \times 8 \times 8 = 64 \times 8 = 512$$

$$\begin{array}{r} 512 \text{ boxes} \\ 27 ) 13824 \\ - 135 \\ \hline 32 \\ - 27 \\ \hline 54 \\ - 54 \\ \hline 0 \end{array}$$

OR

OR other valid process

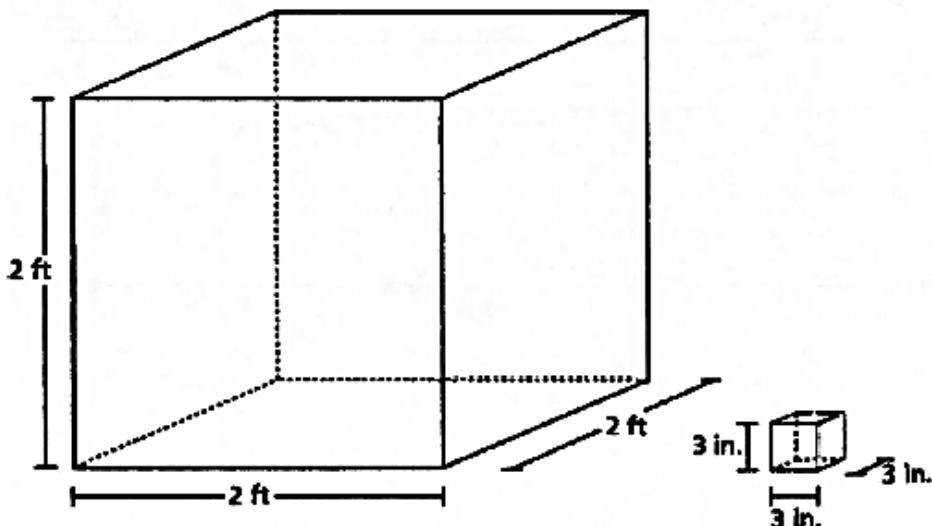
**Answer** 512 boxes of lotion

## GUIDE PAPER 1

Additional

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$2 \text{ ft} = 24$$

$$\begin{array}{r} 1 \\ \times 24 \\ \hline 24 \\ +24 \\ \hline 480 \\ 576 \end{array}$$

$$\begin{array}{r} 1 \\ \times 24 \\ \hline 24 \\ +24 \\ \hline 480 \\ 1520 \end{array}$$

$$\begin{array}{r} 3 \times 3 \\ \times 3 \\ \hline 9 \\ 9 \\ \hline 27 \end{array}$$

$$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \\ 12 \\ -12 \\ \hline 0 \\ 27 \\ -27 \\ \hline 0 \\ 108 \\ +27 \\ \hline 135 \\ 32 \\ -32 \\ \hline 0 \end{array}$$

Answer

512

boxes of lotion

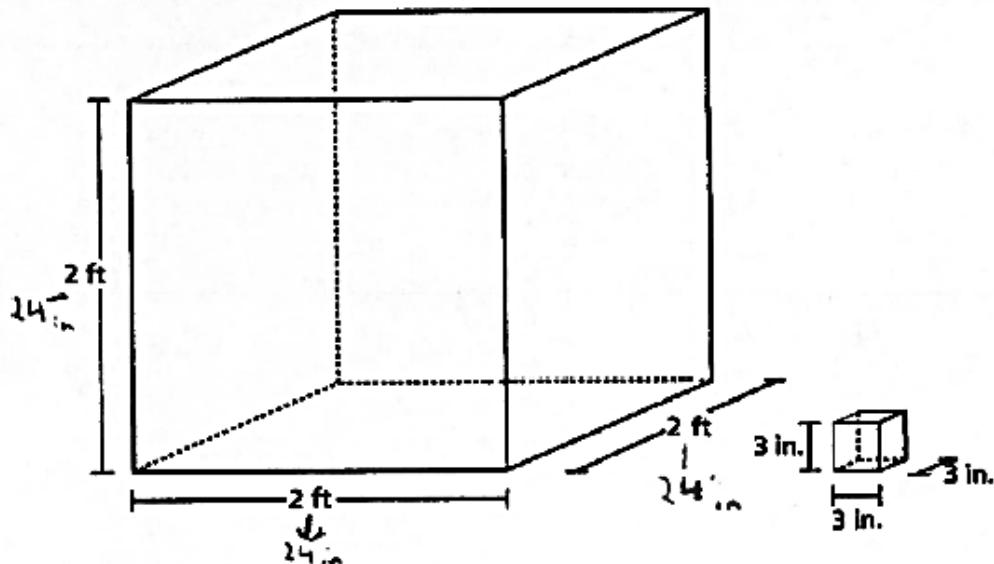
### Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. Feet are correctly converted into inches, the volumes of the shipping crate and lotion boxes are correctly calculated, and those volumes are correctly divided to arrive at the correct solution.

## GUIDE PAPER 2

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.  
Super confusing

$$\begin{array}{r}
 2 \times 2 \times 2 = 27 \\
 \checkmark \quad \checkmark \quad \checkmark \\
 4 \times 2 = 135 \\
 \checkmark \quad \checkmark \\
 8 \text{ ft} \cdot 11 \\
 576 \\
 + 2304 \\
 \hline 13824 \text{ in.}
 \end{array}
 \quad
 \begin{array}{r}
 3 \times 3 \times 3 = 27 \\
 \checkmark \quad \checkmark \quad \checkmark \\
 9 \times 3 = 27 \\
 \checkmark \quad \checkmark \\
 27 \text{ in.} \\
 27 \\
 \times 2 \\
 \hline 54
 \end{array}
 \quad
 \begin{array}{r}
 512 \\
 \checkmark \quad \checkmark \quad \checkmark \\
 27015 \\
 - 54 \\
 \hline 216 \\
 - 54 \\
 \hline 18 \\
 - 18 \\
 \hline 0
 \end{array}$$

**Answer** 512

boxes of lotion

54

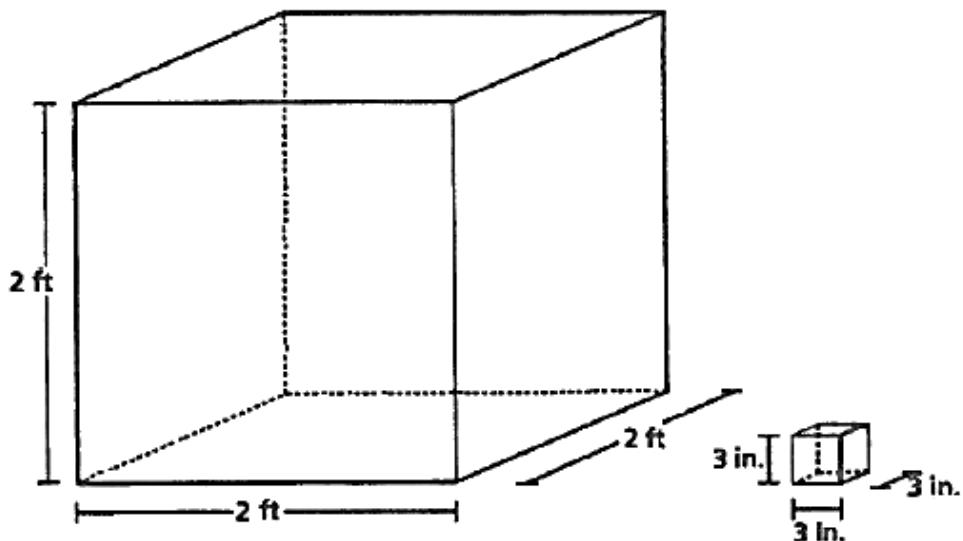
### Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. Feet are correctly converted into inches, the volumes of the shipping crate and lotion boxes are correctly calculated, and those volumes are correctly divided to arrive at the correct solution.

## GUIDE PAPER 3

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$\begin{array}{r} 8 \\ \overline{)124} \\ -8 \\ \hline 44 \\ -36 \\ \hline 8 \\ \times 8 \\ \hline 512 \end{array}$$

Answer

512

boxes of lotion

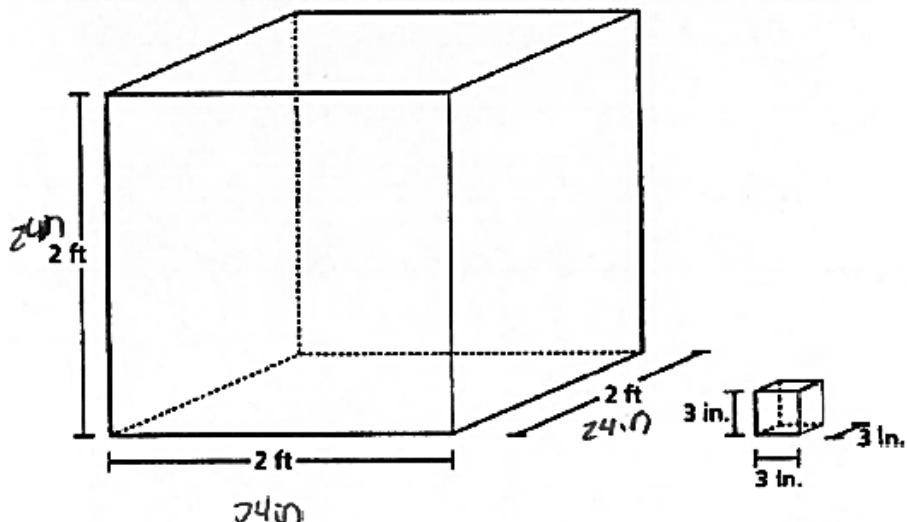
### Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The number of lotion boxes that will fit in a single row inside of the shipping crate is correctly calculated, and then appropriately and correctly cubed to fill the entire volume of the crate.

## GUIDE PAPER 4

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$\begin{array}{r}
 & 1 \\
 & \times 24 \\
 \hline
 & 96 \\
 & + 24 \\
 \hline
 & 1904 \\
 & - 480 \\
 \hline
 & 1142
 \end{array}
 \quad
 \begin{array}{r}
 1 \\
 \times 24 \\
 \hline
 476
 \end{array}
 \quad
 \begin{array}{r}
 3 \\
 \times 3 \\
 \hline
 9
 \end{array}
 \quad
 24 \text{ in}^3$$

$$\begin{array}{r}
 27 \sqrt{1024} \\
 \underline{-108} \\
 \hline
 52 \\
 \underline{-54} \\
 \hline
 84 \\
 \underline{-84} \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 3 \\
 \times 27 \\
 \hline
 81 \\
 \times 2 \\
 \hline
 162 \\
 \underline{-108} \\
 \hline
 54 \\
 \underline{-54} \\
 \hline
 0
 \end{array}$$

Answer

473

boxes of lotion

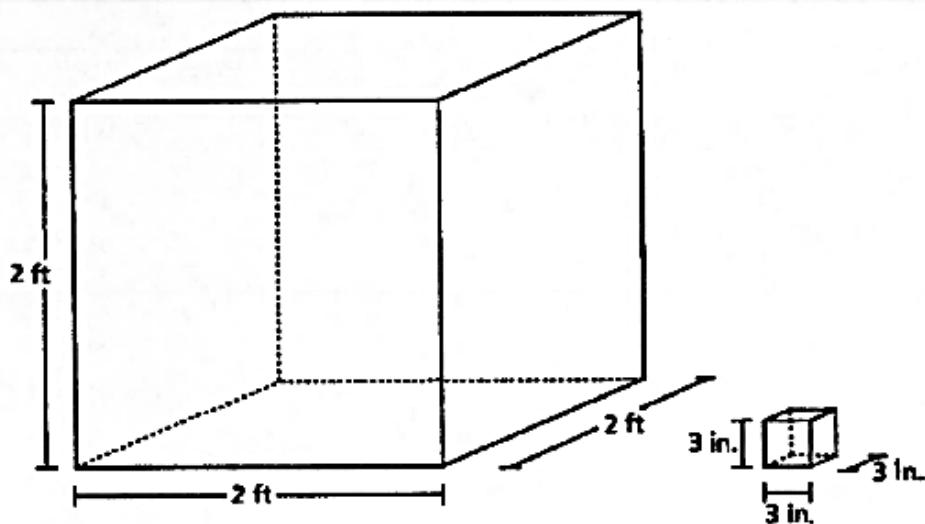
### Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. Feet are correctly converted into inches, the volumes of the shipping crate and lotion boxes are appropriately calculated, and those volumes are correctly divided; however, a calculation error occurs when determining the volume of the crate ( $24 \times 24 = 476$ ), resulting in an incorrect solution. Although the solution is incorrect, appropriate procedures are applied.

## GUIDE PAPER 5

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$2 \times 12 = 24$$

$$\begin{array}{r} 513 \\ \times 27 \\ \hline 13842 \\ -135 \\ \hline 234 \\ -27 \\ \hline 072 \\ -72 \\ \hline 0 \end{array}$$

Answer 513

boxes of lotion

$$\begin{array}{r} (3+3) \times 3 = 27 \text{ in.} \\ \hline 108 \\ -27 \\ \hline 81 \\ -27 \\ \hline 54 \\ -27 \\ \hline 27 \\ -27 \\ \hline 0 \end{array}$$
$$\begin{array}{r} 576 \\ \times 24 \\ \hline 2304 \\ +11520 \\ \hline 13824 \end{array}$$
$$\begin{array}{r} 24 \\ \times 24 \\ \hline 96 \\ +480 \\ \hline 576 \end{array}$$

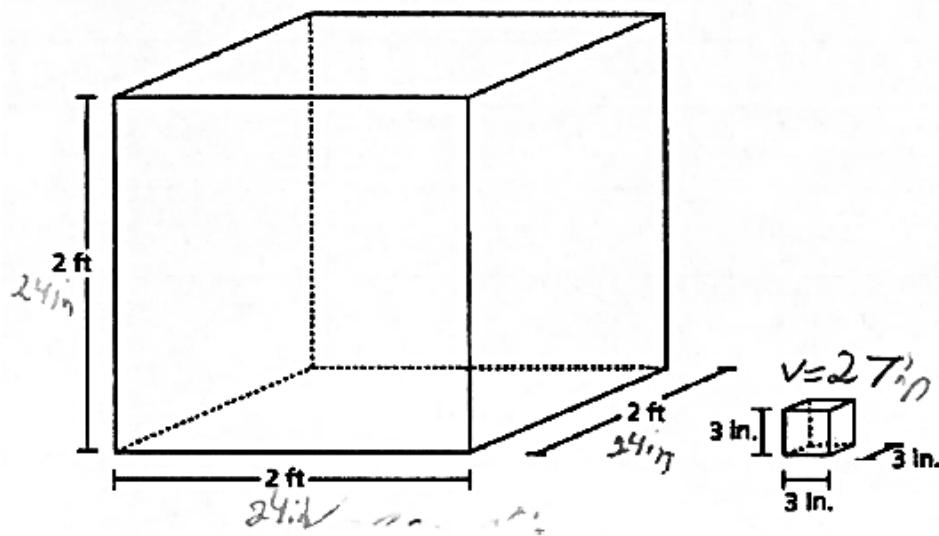
### Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. Feet are correctly converted into inches, the volumes of the shipping crate and lotion boxes are appropriately calculated, and those volumes are divided; however, a calculation error occurs in the division ( $13,842 \div 27 = 513$ ), resulting in an incorrect solution. Although the solution is incorrect, appropriate procedures are applied.

## GUIDE PAPER 6

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$\begin{array}{r} 24 \\ \times 24 \\ \hline 196 \\ 480 \\ \hline 576 \end{array}$$

$$\begin{array}{r} 27576 \\ - 27 \\ \hline 54 \\ - 54 \\ \hline 0 \\ \end{array}$$

Answer

213

boxes of lotion

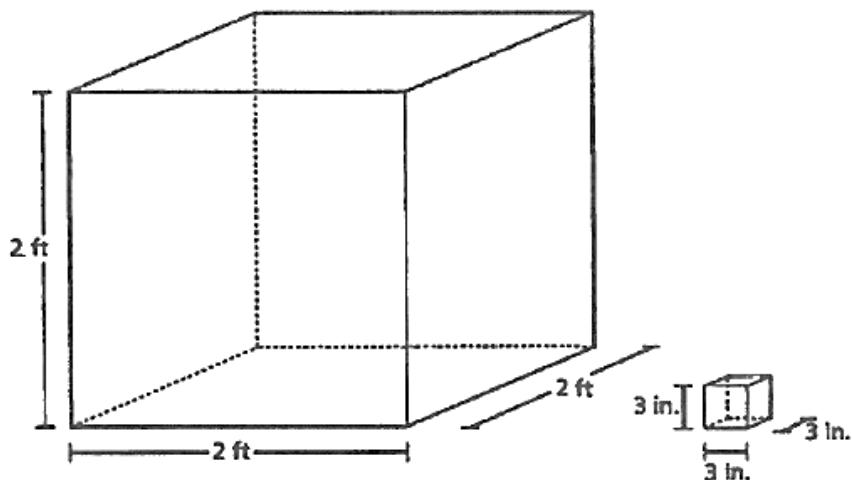
### Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts in the task. Feet are correctly converted into inches, and the volume of a lotion box is appropriately calculated and then the volume of the shipping crate is divided by the volume of a lotion box. However, 24 is only squared instead of cubed when determining the volume of the crate, resulting in an incorrect solution. The response correctly addresses most, but not all, aspects of the task.

## GUIDE PAPER 7

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$24 \text{ in.} \overline{) 8 \text{ ft}} \quad \begin{array}{r} 8 \text{ ft} \\ \times 3 \\ \hline 24 \end{array}$$

$$24 \text{ in.} \overline{) 16 \text{ in.}} \quad \begin{array}{r} 16 \text{ in.} \\ \times 3 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$$

$$8 \text{ ft}$$

$$\begin{array}{r} 3 \text{ in.} \\ \times 3 \\ \hline 9 \\ \times 3 \\ \hline 27 \end{array}$$

$$12 \text{ in.} = 1 \text{ ft}$$

$$\begin{array}{r} 12 \text{ in.} \\ \times 8 \text{ in.} \\ \hline 96 \text{ in.}^2 \\ \times 1 \text{ ft} \\ \hline 168 \text{ ft}^2 \\ 27 \text{ ft}^3 \\ \hline 81 \text{ ft}^3 \end{array}$$

Answer

3

boxes of lotion

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

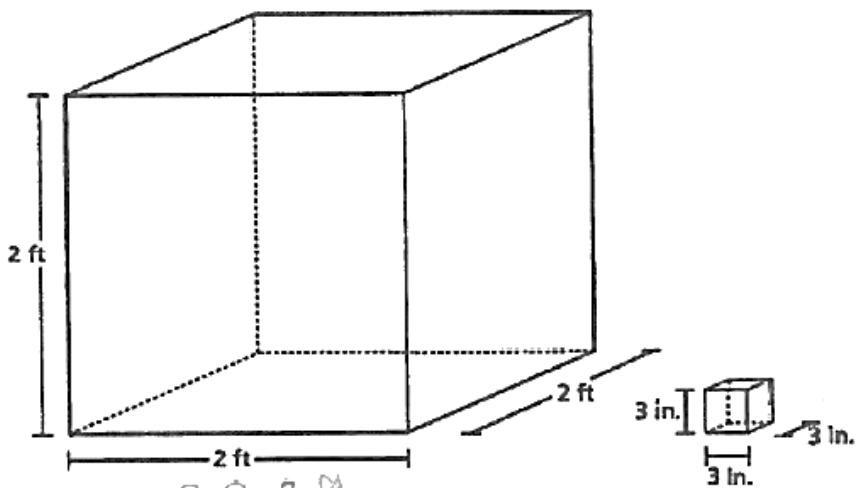
This response demonstrates only a limited understanding of the mathematical concepts in the task. The volume of a lotion box is appropriately and correctly calculated and then the volume of the shipping crate is divided by the volume of a lotion box; however, the volume of the crate is incorrectly calculated by attempting to convert feet to inches after already cubing the value of 2 feet. (Although it is possible to convert afterwards, the conversion factor changes to  $1728 \text{ in}^3/\text{ft}^3$  and the use of 12 in./ft becomes inappropriate.) The response addresses some elements of the task correctly, but reaches an inadequate solution based on faulty reasoning.

## GUIDE PAPER 8

Additional

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$8 \text{ ft.} \quad 27 \div 12 = 1\frac{3}{4} = 1\frac{1}{4}$$

$$27 \text{ in.} = 1\frac{1}{4} \text{ ft.}$$

$$1\frac{1}{4} \times \underline{\quad} = 8 \text{ ft.}$$

$$1\frac{1}{4} \times 6 = \underline{0\frac{1}{2}}$$

$$\frac{1}{4} \times 6$$

$$\frac{5}{4} \times \frac{6}{1} = \frac{30}{4} = 7\frac{1}{2}$$

$$7\frac{1}{2}$$

Answer

boxes of lotion

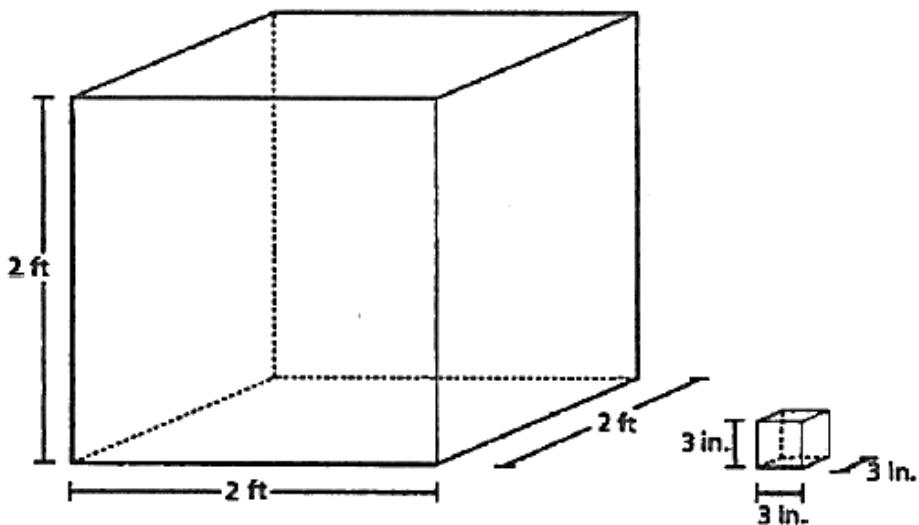
### Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The sides of the lotion box and shipping crate are appropriately cubed to solve the volumes of each; however, similar to Guide Paper 7, an attempt to convert inches to feet is inappropriately and incorrectly applied after this step ( $27 \div 12 = 1\frac{1}{4}$ ). Finally, an attempt to divide the volumes is made via trial-and-error multiplication, but arrives at an incorrect solution. The response addresses only some elements of the task correctly, and reflects a lack of essential understanding of the underlying concepts.

## GUIDE PAPER 9

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$\begin{aligned} & \text{Crate: } 2 \text{ ft and } 6 \text{ in.} \\ & 2 \times 2 \times 2 \\ & 5 \\ & 27 \\ & 4 \times 2 \\ & 8 \\ & \times 2 \\ & \hline 10 \text{ in.} \\ & 216 = 10 \end{aligned}$$
$$\begin{aligned} & \text{Box: } 3 \text{ in.} \\ & 3 \times 3 \times 3 \\ & 9 \times 3 \\ & \hline 27 \end{aligned}$$

Answer

216

boxes of lotion

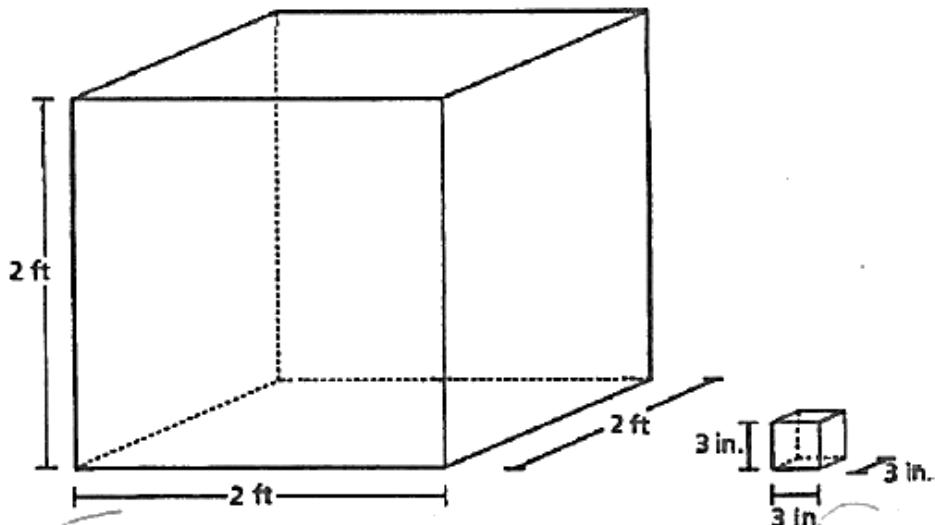
### Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts in the task. The volumes of the shipping crate and lotion box are correctly calculated; however, no attempt is made to convert units, and the volumes are inappropriately multiplied together instead of divided. The response correctly addresses only some elements of the task.

## GUIDE PAPER 10

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

Answer

96

boxes of lotion

$$\begin{array}{r} 112 \\ \times 8 \\ \hline 96 \text{ inches} = 8 \text{ ft.} \\ -16 \\ \hline 9 \\ -9 \\ \hline 0 \\ -0 \\ \hline 0 \\ -54 \\ \hline 0 \\ -54 \\ \hline 0 \\ -6 \\ \hline \end{array}$$

Score Point 0 (out of 3 points)

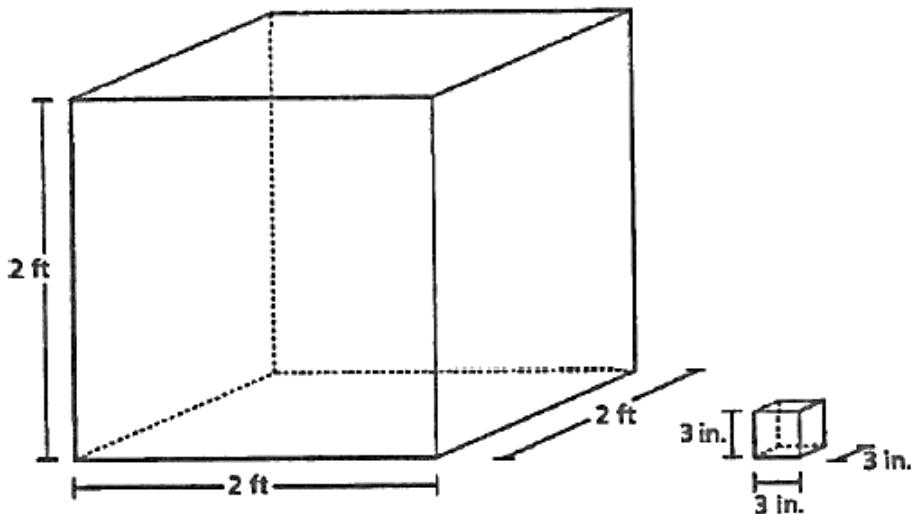
This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Feet are inappropriately converted to inches after already cubing the value of 2 feet, and the volume of a lotion box is inappropriately found, either via addition or by squaring instead of cubing.

## GUIDE PAPER 11

Additional

55

A company puts bottles of lotion into boxes that are three-inch cubes. The boxes were then packed into a shipping crate, shown below.



How many boxes of lotion were packed into the shipping crate to fill it completely?

Show your work.

$$\begin{aligned} &\text{Volume of shipping crate} \\ &2 \times 2 \times 2 = 6 \\ &\text{Volume of boxes} \\ &3 \times 3 \times 3 = 9 \\ &9 + 6 = 15 \end{aligned}$$

Answer

15

boxes of lotion

### 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. Although an appropriate attempt is made to calculate the volumes of the crate and lotion box via cubing, neither calculation is correct ( $2 \times \dots = 6$  and  $3 \times \dots = 9$ ). Additionally, no attempt is made to convert units, and the incorrect volumes are inappropriately added together rather than divided.