

# New York NYSTP 2022 Grade 7 Math

Reference Materials  
Page 2

Exam Materials  
Pages 3 - 24

Answer Key Materials  
Page 25

Rubric Materials  
Pages 26 - 103

# Grade 7 Mathematics Reference Sheet

## CONVERSIONS

1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5,280 feet	1 pound = 0.454 kilogram	1 quart = 2 pints
1 mile = 1,760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2,000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallon
		1 liter = 1,000 cubic centimeters

---

## FORMULAS

**Triangle**

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

---

**Parallelogram**

$$A = bh$$

---

**Circle**

$$A = \pi r^2$$

---

**Circle**

$$C = \pi d \text{ or } C = 2\pi r$$

---

**General Prisms**

$$V = Bh$$

---

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



# New York State Testing Program

---

## 2022 Mathematics Test Session 1

Grade **7**

April 26–28, 2022

**RELEASED QUESTIONS**

# Session 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 making your choice.
- You have been provided with mathematics tools (a ruler, a protractor, and a calculator) 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.

**1** Based on a weather report, the probability that it will rain tomorrow is 0.13. Which word describes the likelihood that it will rain tomorrow?

- A certain
- B impossible
- C likely
- D unlikely

**2** Two stores each advertise a discount on the same type of watch. At both stores, the original price of the watch was \$35.00.

- Store A discounts the price of the watch by 20%.
- Store B discounts the price of the watch by 15%.

How much less is the discounted price of the watch at Store A than the discounted price of the watch at Store B ?

- A \$1.75
- B \$5.00
- C \$5.25
- D \$7.00

**GO ON**

**4**

A spinner has five equal-sized sections colored blue, red, orange, yellow, and green. The arrow on the spinner was spun 50 times during an experiment. The results are shown in the table below.

### RESULTS OF EXPERIMENT

Color	Frequency
Blue	12
Red	15
Orange	6
Yellow	10
Green	7

Based on the results, what is the experimental probability that on any one spin, the arrow will land on the red section?

- A**  $\frac{1}{15}$
- B**  $\frac{1}{5}$
- C**  $\frac{3}{7}$
- D**  $\frac{3}{10}$

**5**

Which expression is equivalent to  $-3(2x - 8) + 4x$ ?

- A**  $-2x - 8$
- B**  $-2x + 24$
- C**  $-10x - 8$
- D**  $-10x + 24$

**GO ON**

**9**

The data set shown below represents the distribution of daily high temperatures in a city for 8 days.

79, 73, 72, 70, 72, 66, 81, 75

What is the median daily high temperature, in degrees Fahrenheit, in the city?

- A 71
- B 72.5
- C 73
- D 73.5

**10**

The menu at an ice cream store is shown below.

ICE CREAM MENU		
<u>Size</u>	<u>Flavor</u>	<u>Topping</u>
Small	Vanilla	Dip
Medium	Chocolate	Sprinkles
Large	Strawberry	Crunch Coat

How many different choices of one size, one flavor, and one topping can be made from the menu?

- A 3
- B 9
- C 18
- D 27

**GO ON**

**11**

The cost for 10 ounces of organic blueberries is \$2.70. Which equation can be used to determine  $x$ , the cost, in dollars, for 30 ounces of organic blueberries?

A  $\frac{10}{2.7} = \frac{x}{30}$

B  $\frac{2.7}{10} = \frac{30}{x}$

C  $\frac{10}{2.7} = \frac{30}{x}$

D  $\frac{2.7}{30} = \frac{x}{10}$

**GO ON**

**19**

Which expression has the same value as the expression shown below?

$$-\frac{3}{8} - \frac{7}{8}$$

- A  $\frac{3}{8} + \frac{7}{8}$
- B  $-\frac{3}{8} + \frac{7}{8}$
- C  $\frac{3}{8} + \left(-\frac{7}{8}\right)$
- D  $-\frac{3}{8} + \left(-\frac{7}{8}\right)$

**20**

A chef made 150 cups of chili and sold 60% of it. A serving size of the chili is  $1\frac{2}{3}$  cups. How many servings of chili were sold?

- A 36
- B 54
- C 90
- D 100

**21**

At sunset, a thermometer had a reading of 4°F. During the night, the temperature decreased 15°F. After the decrease, what is the total number of degrees that the temperature must change for the thermometer to read 0°F?

- A 4°F
- B 11°F
- C 15°F
- D 19°F

**GO ON**

**25** A gardener uses a total of 61.5 gallons of gasoline in one month. Of the total amount of gasoline,  $\frac{3}{5}$  was used in his lawn mowers. How many gallons of gasoline did the gardener use in his lawn mowers in the one month?

- A** 12.3
- B** 24.6
- C** 26.5
- D** 36.9

**26** A machine in a factory makes  $2\frac{1}{4}$  pounds of nails in  $1\frac{1}{2}$  hours. At what rate, in pounds per hour, does the machine make nails?

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

**GO ON**

**28**

The table below shows a proportional relationship between  $x$  and  $y$ .

$x$	$y$
0.50	0.750
1.25	1.875
3.00	4.500
6.75	10.125

What is the constant of proportionality for the relationship between  $x$  and  $y$ ?

- A 0.25
- B 0.50
- C 1.50
- D 1.75

**GO ON**

**31**

Mr. Jensen purchased an airline ticket on a web site. The original price of the airline ticket was \$473.00. He used a coupon code to receive a 20% discount. A sales tax of 12% was applied after the discount. What was the total purchase price of the airline ticket after the discount, including sales tax?

- A \$105.92
- B \$332.99
- C \$423.81
- D \$529.76

**32**

What is the value of  $12.5 - \frac{31}{2} + 1\frac{1}{4}$ ?

- A -20.25
- B -17.25
- C  $-\frac{17}{4}$
- D  $-\frac{7}{4}$

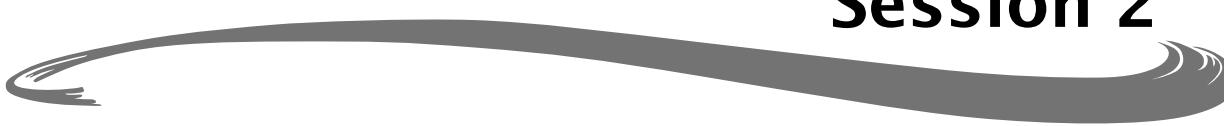
**33**

On a map, two cities are 2.8 inches apart. The map has a scale of 1 inch to 25 miles. How far apart, in inches, would the same two cities be on a map that has a scale of 1 inch to 40 miles?

- A 1.20
- B 1.60
- C 1.75
- D 1.80

**STOP**

# Session 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 making your choice or writing your response.
- You have been provided with mathematics tools (a ruler, a protractor, and a calculator) 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.

**34**

Katelyn wants to buy a \$75.00 skateboard. She has \$25.00 saved so far. She mows lawns to make extra money and earns \$20.00 for each lawn she mows. Which inequality can be used to determine the number of lawns,  $x$ , she needs to mow to have enough money to buy the skateboard?

A  $25 + 20x \leq 75$

B  $25 + 20x \geq 75$

C  $20 + 25x \leq 75$

D  $20 + 25x \geq 75$

**35**

A coach compared the heights of the players on two different teams. The data set is shown in the table below.

**HEIGHTS OF PLAYERS ON TWO TEAMS**

<b>Team A Player Heights (inches)</b>	76	68	73	65	60	63	69	76
<b>Team B Player Heights (inches)</b>	63	73	64	70	70	67	75	62

Based on these data, which statement is true?

- A The mean height of the players on Team B is greater than the mean height of the players on Team A.
- B The mean height of the players on Team A is greater than the mean height of the players on Team B.
- C The median height of the players on Team B is greater than the median height of the players on Team A.
- D The median height of the players on Team A is greater than the median height of the players on Team B.

**GO ON**

**36**

What is the value of the expression below?

$$-36 \div 9 + 3(-7) + 2$$

- A -23
- B -19
- C 9
- D 15

**37**

A cook uses  $1\frac{3}{4}$  teaspoons of salt to make  $3\frac{1}{2}$  pounds of pasta. What is the unit rate, in teaspoons per pound, at which the cook uses salt to make pasta?

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

**38**

The expression  $48y - 16$  represents the perimeter, in feet, of a square. Which expression represents the length, in feet, of each side of the square?

- A  $12y - 4$
- B  $12y - 16$
- C  $24y - 8$
- D  $48y - 4$

**GO ON**

**39**

The equation  $y = 4.3x$  can be used to determine the total cost,  $y$ , in dollars, of  $x$  pounds of apples. What does the number 4.3 represent in the equation?

- A the number of apples in 1 pound
- B the number of apples in  $x$  pounds
- C the cost of 1 pound of apples
- D the cost of  $x$  pounds of apples

**40**

Which expression is equivalent to the expression shown below?

$$2 + 3(2x + 5)$$

- A  $7 + 6x$
- B  $17 + 2x$
- C  $17 + 6x$
- D  $25 + 10x$

**GO ON**

**41**

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

### STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will **most likely** have a preference to do their classwork online?

*Show your work.*

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

**GO ON**

**42**

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

*Show your work.*

*Answer* \_\_\_\_\_ candy bars

**GO ON**

**43**

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

*Show your work.*

*Answer* \_\_\_\_\_ pages per minute

**GO ON**

**44**

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

*Show your work.*

*Answer* \_\_\_\_\_  $^{\circ}\text{F}$

**GO ON**

**45**

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

*Show your work.*

*Answer*   \$ \_\_\_\_\_

**GO ON**

**46**

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C: 13

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

*Explain your answer.*

---

---

---

**GO ON**

**47**

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

*Equation* \_\_\_\_\_

What was the cost, in dollars, of each admission ticket, including tax?

*Show your work.*

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

**GO ON**

**48**

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

*Show your work.*

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

**STOP**

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

2022 Mathematics Tests Map to the Standards

Grade 7

Question	Type	Key	Points	Standard	Cluster
<b>Session 1</b>					
1	Multiple Choice	D	1	CCSS.Math.Content.7.SP.C.5	Statistics and Probability
2	Multiple Choice	A	1	CCSS.Math.Content.7.RP.A.3	Ratios and Proportional Relationships
4	Multiple Choice	D	1	CCSS.Math.Content.7.SP.C.7b	Statistics and Probability
5	Multiple Choice	B	1	CCSS.Math.Content.7.EE.A.1	Expressions and Equations
9	Multiple Choice	B	1	CCSS.Math.Content.6.SP.A.3	Statistics and Probability
10	Multiple Choice	D	1	CCSS.Math.Content.7.SP.C.8b	Statistics and Probability
11	Multiple Choice	C	1	CCSS.Math.Content.7.RP.A.2c	Ratios and Proportional Relationships
19	Multiple Choice	D	1	CCSS.Math.Content.7.NS.A.1c	The Number System
20	Multiple Choice	B	1	CCSS.Math.Content.7.EE.B.3	Expressions and Equations
21	Multiple Choice	B	1	CCSS.Math.Content.7.NS.A.1b	The Number System
25	Multiple Choice	D	1	CCSS.Math.Content.7.NS.A.3	The Number System
26	Multiple Choice	C	1	CCSS.Math.Content.7.RP.A.1	Ratios and Proportional Relationships
28	Multiple Choice	C	1	CCSS.Math.Content.7.RP.A.2b	Ratios and Proportional Relationships
31	Multiple Choice	C	1	CCSS.Math.Content.7.RP.A.3	Ratios and Proportional Relationships
32	Multiple Choice	D	1	CCSS.Math.Content.7.EE.B.3	Expressions and Equations
33	Multiple Choice	C	1	CCSS.Math.Content.7.G.A.1	Geometry
<b>Session 2</b>					
34	Multiple Choice	B	1	CCSS.Math.Content.7.EE.B.4b	Expressions and Equations
35	Multiple Choice	B	1	CCSS.Math.Content.7.SP.B.4	Statistics and Probability
36	Multiple Choice	A	1	CCSS.Math.Content.7.EE.B.3	Expressions and Equations
37	Multiple Choice	A	1	CCSS.Math.Content.7.RP.A.1	Ratios and Proportional Relationships
38	Multiple Choice	A	1	CCSS.Math.Content.7.EE.A.1	Expressions and Equations
39	Multiple Choice	C	1	CCSS.Math.Content.7.RP.A.2b	Ratios and Proportional Relationships
40	Multiple Choice	C	1	CCSS.Math.Content.7.EE.A.1	Expressions and Equations
41	Constructed Response	2	CCSS.Math.Content.7.SP.A.2	Statistics and Probability	
42	Constructed Response	2	CCSS.Math.Content.7.NS.A.3	The Number System	
43	Constructed Response	2	CCSS.Math.Content.7.RP.A.2b	Ratios and Proportional Relationships	
44	Constructed Response	2	CCSS.Math.Content.7.NS.A.1c	The Number System	
45	Constructed Response	2	CCSS.Math.Content.7.EE.B.3	Expressions and Equations	
46	Constructed Response	2	CCSS.Math.Content.7.NS.A.2b	The Number System	
47	Constructed Response	2	CCSS.Math.Content.7.EE.B.4a	Expressions and Equations	
48	Constructed Response	3	CCSS.Math.Content.7.RP.A.3	Ratios and Proportional Relationships	

\*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 Points</b>	A 2-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 1-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 Points*</b>	A 0-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**

<b>3 Points</b>	<p>A 3-point response includes the correct solution(s) to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none"><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 Points</b>	<p>A 2-point response demonstrates a partial understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none"><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>	<p>A 1-point response demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task.</p> <p>This response</p> <ul style="list-style-type: none"><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 Points*</b>	<p>A 0-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.</p>

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

## **2022 2- and 3-Point Mathematics Scoring Policies**

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

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

## EXEMPLARY RESPONSE

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

### STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will **most likely** have a preference to do their classwork online?

**Show your work.**

$x$  is the number of students out of 350 who are likely to prefer to do classwork online

$$\frac{17}{(17+8)} = \frac{x}{350}$$

$$25x = 17(350)$$

$$x = 238 \text{ students}$$

*or*

$$17 + 8 = 25$$

$$350 \div 25 = 14$$

$$14 \times 17 = 238 \text{ students}$$

*or*

$x$  is the number of students out of 100 who are likely to prefer to do classwork online

$$\frac{17}{(17+8)} = \frac{x}{100}$$

$$25x = 17(100)$$

$$x = 68, \text{ which is } 68\%$$

$$350 \times 0.68 = 238 \text{ students} \text{ or}$$

$$300 \times 0.68 = 204 \text{ and } 50 \times 0.68 = 34, \text{ then } 204 + 34 = 238 \text{ students}$$

*or other valid process*

**Answer** 238 students

# GUIDE PAPER 1

Additional

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

## STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will most likely have a preference to do their classwork online?

Show your work.

$$\begin{aligned}17+8 &= 25 \\ \frac{25}{17} \times \frac{17}{25} &= \frac{x}{350} \times \frac{25}{17} \quad 1700 \times 1 = \frac{25\%}{1700} \times 1700 \\ 5950 \times 1 &= \frac{25\%}{5950} \times 5950 \quad 1700 = 25\% \\ \frac{5950}{25} &= \frac{25\%}{25} \quad 68 = x \\ 238 &= x \quad 350 \times 68\% \\ &\underline{238 = x} \quad \underline{350 \times 0.68 = 238}\end{aligned}$$

Answer 238 students

## Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The number of students out of 350 who will most likely have a preference to do their classwork online is correctly calculated using two distinct methods. This response is complete and correct.

## GUIDE PAPER 2

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

### STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will **most likely** have a preference to do their classwork online?

**Show your work.**

$$\frac{\text{online}}{\text{total}} \quad \frac{17}{25} = \frac{x}{350}$$

$$25x = 5950$$

$$5950 \div 25 = 238$$

$$x = 238$$

**Answer**

238

students

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The number of students out of 350 who will most likely have a preference to do their classwork online is correctly calculated using a proportion. This response is complete and correct.

## GUIDE PAPER 3

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

### STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will **most likely** have a preference to do their classwork online?

*Show your work.*

$$\begin{aligned}17+8 &= 25 \\350/25 &= 14 \\14 \times 17 &= 238\end{aligned}$$

**Answer**

238

students

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The number of students out of 350 who will most likely have a preference to do their classwork online is correctly calculated. This response is complete and correct.

## GUIDE PAPER 4

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will most likely have a preference to do their classwork online?

Show your work.

Online - 17

Paper - 8

$$17 + 8 = 25$$

$$25 \div 350 = \underline{\hspace{2cm}} 14$$

$$\begin{array}{r} 19 \\ 17 \times \cancel{4} = \cancel{68} 238 \\ \hline 8 \times \cancel{4} = 32 \quad 12 \end{array}$$

Answer 238 students

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The number of students out of 350 who will most likely have a preference to do their classwork online is correctly calculated; however, the division is written in an incorrect order. This response correctly addresses only some elements of the task.

# GUIDE PAPER 5

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

25 total

Based on the results, how many students out of 350 will most likely have a preference to do their classwork online?

Show your work.

$$\frac{17}{25} \cdot .14 \quad \frac{238}{350}$$

$$\frac{8}{25} \cdot .14 \quad \frac{112}{350}$$

Answer Online students

## Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The number of students out of 350 who will most likely have a preference to do their classwork online and on paper are calculated correctly. It is unclear which part of the circled answer is intended as the solution. This response correctly addresses only some elements of the task.

## GUIDE PAPER 6

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will most likely have a preference to do their classwork online?

Show your work.

$$\frac{17}{25} = .68 = 68\%$$
$$\frac{17}{350} \frac{68}{100}$$

Answer 210 students

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The number of students out of 350 who will most likely have a preference to do their classwork online is correctly calculated as a percentage. It is unclear how the incorrect solution of the number of students is obtained. This response correctly addresses only some elements of the task.

# GUIDE PAPER 7

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

>25

Based on the results, how many students out of 350 will **most likely** have a preference to do their classwork online?

Show your work.

$$\frac{17}{350} = \frac{?}{100}$$

$$\begin{aligned} &\cancel{17} \quad \cancel{350} = 4.85 \\ &\cancel{350} \end{aligned}$$

$$\begin{aligned} 100x &= \frac{5950}{100} \\ x &= 59.5 \\ x &= 60 \end{aligned}$$

Answer 60 students

## Score Point 0 (out of 2 points)

Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. This response contains an incorrect solution using an obviously incorrect procedure.

# GUIDE PAPER 8

Additional

41

A teacher surveys a random group of students about their preference for doing classwork online or on paper. The results are shown in the table below.

## STUDENT CLASSWORK PREFERENCE

Preference	Number of Students
Online	17
Paper	8

Based on the results, how many students out of 350 will **most likely** have a preference to do their classwork online?

*Show your work.*

$$\begin{aligned}8+17 &= 25 \\350 \div 25 &= 14 \\14 \text{ for } 17 \\7 \text{ for } 8\end{aligned}$$

*Answer*

350

students

### 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. Although a correct division determines the 14 partitions of 25 out of the original 350, it is used incorrectly in the work that follows, demonstrating no overall understanding of this process.

## EXEMPLARY RESPONSE

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

*Show your work.*

$$13(9.50) + 3(25.00) = 123.50 + 75.00 = 198.50$$

$$250.00 - 198.50 = 51.50$$

$$51.50 \div 1.75 \approx 29.4285714$$

29 candy bars

*or*

$x$  is the greatest number of candy bars

$$13(9.50) + 3(25.00) + 1.75x \leq 250.00$$

$$123.50 + 75.00 + 1.75x \leq 250.00$$

$$198.50 + 1.75x \leq 250.00$$

$$1.75x \leq 51.50$$

29 candy bars

(Note: work with an equal sign in place of the less than or equal sign is acceptable)

*or other valid process*

**Answer** 29 candy bars

# GUIDE PAPER 1

Additional

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

*Show your work.*

$$\begin{aligned}13 \times 9.50 &= 123.50 \\25 \times 3 &= 75 \\123.50 + 75.00 &= 198.50 \\250.00 - 198.50 &= 51.50 \\51.50 \div 1.75 &= 29.4285...\end{aligned}$$

**Answer**

Marcy will be able to buy 29 candy bars.

candy bars

## Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The greatest number of candy bars Marcy can buy is correctly calculated and truncated to the whole number using sound procedures. This response is complete and correct.

## GUIDE PAPER 2

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

Show your work.

$$9.50 \cdot 13 = 123.5$$

$$25 \cdot 3 = 75$$

$$123.5 + 75 = 198.5$$

$$250 - 198.5 = 51.5$$

$$\frac{51.5}{1.75} = 29 \text{ candy bars}$$

Answer 29 candy bars

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The greatest number of candy bars Marcy can buy is correctly calculated and truncated to the whole number using sound procedures. This response is complete and correct.

## GUIDE PAPER 3

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

Show your work.

Total amount

$$\begin{array}{r} \$250.00 \\ - 123.5 \\ \hline 126.5 \end{array}$$
$$9.50(13) = \$123.5$$
$$\begin{array}{r} 25(3) = 75 \\ - 126.5 \\ \hline 51.5 \end{array}$$

Now, Marcy has \$51.5 left, and she wants to buy candy bars for her fundraiser.

She can buy 29 candy bars.

Answer 29 candy bars

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The greatest number of candy bars Marcy can buy is correctly calculated and truncated to the whole number using sound procedures. Although the final division to determine the solution is not shown and only explained, sufficient work is shown to demonstrate a complete understanding.

## GUIDE PAPER 4

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

*Show your work.*

$$\begin{aligned} 9.50 \times 13 &= 123.5 \\ 25.00 \times 3 &= 75 \\ 123.5 + 75 &= 198.5 \\ 250 - 198.5 &= 51.5 \end{aligned}$$

How many times can 1.75  
go into 51.5?

$$\begin{aligned} 51.5 \div 1.75 &= 29.428 \\ 29.428 & \end{aligned}$$

**Answer**

29.429

candy bars

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The greatest number of candy bars Marcy can buy is correctly calculated using sound procedures; however, the solution is not truncated to the correct whole number of candy bars. This response correctly addresses only some elements of the task.

# GUIDE PAPER 5

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

Show your work.

$$\begin{aligned}13(9.5) + 3(25) + 1.75(x) &\leq 225 \\123.5 + 75 + 1.75(x) &\leq 225 \\-198.5 + 1.75(x) &\leq 225.0 \\-198.5 \\1.75(x) &\leq \frac{26.5}{1.75} = x = 15\end{aligned}$$

Answer 15 candy bars

## Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. An inequality is written to solve for the greatest number of candy bars Marcy can buy and the solution is truncated to the whole number; however, the total amount of money Marcy has to spend is incorrectly transcribed as 225, not 250. The rest of the work is correct. This response contains an incorrect solution but applies a mathematically appropriate process.

## GUIDE PAPER 6

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

**Show your work.**

$$250.00 - 123.50 - 75.00 = 51.50$$

$$9.50 \times 13 = 123.50$$

$$25.00 \times 3 = 75.00$$

$$\text{candy bars} = 1.75$$

$$51.50 \div$$

**Answer**

candy bars

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The amount of money Marcy has left after buying the movie passes and gift cards is correctly calculated; however, the final step of determining the number of candy bars that can be purchased is not completed. This response correctly addresses only some elements of the task.

## GUIDE PAPER 7

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

Show your work.

$$\begin{array}{r} 250.00 \\ - 9.50 \\ \hline 240.5 \end{array}$$
$$\begin{array}{r} 240.5 \\ - 25.00 \\ \hline 215.5 \end{array}$$
$$\begin{array}{r} 215.5 \\ \times 1.75 \\ \hline 377 \end{array}$$

Answer 377 candy bars

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

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect solution is obtained using an obviously incorrect procedure.

# GUIDE PAPER 8

Additional

42

Marcy is buying prizes to give away at a fundraiser, as described below.

- She has \$250.00 to spend.
- She buys 13 movie passes for \$9.50 each.
- She buys 3 gift cards valued at \$25.00 each.
- She will use the rest of the money to buy candy bars that cost \$1.75 each.

What is the greatest number of candy bars she can buy with the rest of the money?

Show your work.

$$\begin{array}{r} \$9.50 + 125.00 = 34.5 + 1.75 \\ 250 - 36.25 \quad \quad \quad 36.25 \\ \hline \quad \quad \quad 6.896 \end{array}$$

Answer 7 candy bars

## 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. Numbers from the prompt are added, and then divided, without conveying any understanding of the task.

## EXEMPLARY RESPONSE

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

*Show your work.*

$$\frac{175}{5} = \frac{35 \text{ pages}}{1 \text{ minute}}$$

*or*

$$175 : 5$$

simplifies to

$$35 : 1$$

So, 35 pages per minute

*or other valid process*

*Answer*    35    pages per minute

# GUIDE PAPER 1

Additional

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

*Show your work.*

$$\begin{array}{r} 175 \text{ pages} \div 5 = 35 \\ \hline 5 \text{ min} \div 5 = 1 \end{array}$$

*Answer*

35

pages per minute

## Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The unit rate is correctly calculated by dividing the number of pages by the number of minutes. This response is complete and correct.

## GUIDE PAPER 2

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

Show your work.

$$\frac{175}{5} = \frac{35}{1}$$

Answer 35 pages per minute

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The unit rate is correctly calculated by dividing the number of pages by the number of minutes. This response is complete and correct.

## GUIDE PAPER 3

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

Show your work.

$$\begin{array}{rcl} 175 \text{ pages} & : & 5 \text{ minutes} \\ \downarrow & & \downarrow \\ \div 5 & & \div 5 \\ \downarrow & & \downarrow \\ 35 \text{ pages} & : & 1 \text{ minute} \end{array}$$

Answer 35 pages per minute

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The unit rate is correctly calculated by simplifying the ratio of the number of pages to the number of minutes. This response is complete and correct.

## GUIDE PAPER 4

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

Show your work.

$$\overline{5} \overline{\overline{)175}} \overset{102}{\Rightarrow} 0.02$$

$$\begin{array}{r} 175 \\ \div 5 \\ \hline 35 \end{array}$$

Answer \_\_\_\_\_ pages per minute

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The correct process is used to calculate the unit rate by dividing the number of pages by the number of minutes; however, a calculation error results in an incorrect solution. This response correctly addresses only some elements of the task.

## GUIDE PAPER 5

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

*Show your work.*

$$175 \div 5 = 35$$

*Answer*

$$35 \times 60 = 2100$$

pages per minute

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The unit rate is correctly calculated by dividing the number of pages by the number of minutes; however, further multiplication of the unit rate by 60 converts the unit rate from pages per minute into pages per hour. This response correctly addresses only some elements of the task.

## GUIDE PAPER 6

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

*Show your work.*

$$\begin{array}{r} 5 \\ 175 \\ \hline x \\ 175 \div 5 \end{array}$$

*Answer*

The unit rate of  
pages is  $\frac{1}{35}$

pages per minute

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. A correct ratio and division process are shown; however, the solution is incorrectly provided as a reciprocal of the unit rate. This response correctly addresses only some elements of the task.

## GUIDE PAPER 7

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

Show your work.

$$175 \div 5 = 35 \div 5 = 7$$

Answer 7 pages per minute

### 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. Although the unit rate is correctly calculated by dividing the number of pages by the number of minutes, the correct solution is not identified. Holistically, further division of the unit rate by 5 demonstrates no overall understanding of the task.

# GUIDE PAPER 8

Additional

43

At a company, a copy machine prints 175 pages in 5 minutes. If the number of pages printed is proportional to the time, in minutes, what is the unit rate?

Show your work.

$$\frac{175}{5} = 35$$

Answer

35

pages per minute

**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 unit rate is calculated as the reciprocal rate and is inappropriately truncated.

## EXEMPLARY RESPONSE

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

*Show your work.*

$$|-15| + 35 = 50$$

So,  $50^{\circ}\text{F}$  is the total change in temperature

*or*

$$-15 + 50 = 35$$

So,  $50^{\circ}\text{F}$  is the total change in temperature

*or*

$$35 - (-15) = 50$$

So,  $50^{\circ}\text{F}$  is the total change in temperature

*or other valid process*

**Answer** 50  $^{\circ}\text{F}$

# GUIDE PAPER 1

Additional

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

Show your work.

$$\begin{aligned} |-15| &= 15 \\ 35^{\circ} + 15^{\circ} &= 50^{\circ}\text{F} \end{aligned}$$

Answer

50° °F

## Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The total change in temperature is correctly determined using an equation adding the absolute values of the initial and the final temperature. This response is complete and correct.

## GUIDE PAPER 2

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

*Show your work.*

$$\begin{aligned}-15 + x &= 35 \\ x &= 50\end{aligned}$$

*Answer*

50   $^{\circ}\text{F}$

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The total change in temperature is correctly determined using an equation. This response is complete and correct.

## GUIDE PAPER 3

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

*Show your work.*

$$\begin{array}{cccccccccc} -15 & -10 & -5 & 0 & 5 & 10 & 15 & 20 & 25 & 30 & 35 \\ -15 + 50 = 35 \end{array}$$

*Answer*

50    $^{\circ}\text{F}$

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The total change in temperature is correctly determined using a number line and by solving an equation. This response is complete and correct.

## GUIDE PAPER 4

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

Show your work.

$$\begin{array}{r} 30 \\ + 15 \\ \hline 45^{\circ}\text{F} \end{array}$$

Answer

45<sup>°</sup>F

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. A correct process of adding the absolute values of the initial and final temperature is used to solve for the total change in temperature; however, the noon temperature of the food is incorrectly written as 30, not 35, resulting in an incorrect solution. This response contains an incorrect solution but applies a mathematically appropriate process.

## GUIDE PAPER 5

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

*Show your work.*

$$-15 - 35 = -50$$

The temperature changed by  $-50$  degrees.

*Answer*

-50

$^{\circ}\text{F}$

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The total change in temperature is calculated to show how much the package has cooled instead of how much it has warmed; however, the work shows understanding of how to determine the change in temperatures. This response correctly addresses only some of the elements of the task.

## GUIDE PAPER 6

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

*Show your work.*

$$-15 + x = 35$$

$$35 - -15 = 45$$

$$x = 45$$

*Answer*

45

$^{\circ}\text{F}$

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. A correct process is written to solve for the total change in temperature; however, a calculation error occurs ( $35 - -15 \neq 45$ ), resulting in an incorrect solution. This response contains an incorrect solution but applies a mathematically appropriate process.

## GUIDE PAPER 7

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

Show your work.

$-15^{\circ}\text{F}$

$35^{\circ}\text{F}$

$$35 + (-15) = M$$

$$M = 20^{\circ}\text{F}$$

Answer 20  $^{\circ}\text{F}$

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

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect solution is obtained using an obviously incorrect procedure.

# GUIDE PAPER 8

Additional

44

A cook removes a package of food from a freezer and begins to defrost the package.

- The initial temperature of the package of food is  $-15^{\circ}\text{F}$ .
- At noon, the temperature of the package of food has increased to  $35^{\circ}\text{F}$ .

What is the total change in temperature, in degrees Fahrenheit, for the package of food?

*Show your work.*

the total change in the temperature in degrees fahrenheit is 50

*Answer*

50   $^{\circ}\text{F}$

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

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The correct solution is not supported with any work.

## EXEMPLARY RESPONSE

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

*Show your work.*

$$50(0.90) + 50(1.06) + 50(0.86) =$$

$$45 + 53 + 43 = 141 \text{ dollars}$$

*or*

$$\frac{45}{50} = \frac{90}{100}$$

$$\frac{53}{50} = \frac{106}{100}$$

$$\frac{43}{50} = \frac{86}{100}$$

$$45 + 53 + 43 = 141 \text{ dollars}$$

*or other valid process*

**Answer** \$ 141

# GUIDE PAPER 1

Additional

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

Show your work.

Day 1

$$0.9 \times 50 = 45$$

$$\begin{array}{r} 100 \\ - 14 \\ \hline 86 \end{array}$$

Day 2

$$1.06 \times 50 = 53$$

Day 3

$$0.86 \times 50 = 43$$

$$\begin{array}{r} 45 \\ 53 \\ + 43 \\ \hline 141 \end{array}$$

Answer \$ 141

## Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The money earned from ticket sales on each of the three days is correctly calculated and totaled using sound procedures. This response is complete and correct.

## GUIDE PAPER 2

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

**Show your work.**

$$\begin{aligned} 50 &= 100\% \\ \div 10 &\quad \div 10 \\ 5 &= 10\% \\ 100\% - 10\% &= 90\% \\ 50 - 5 &= 45 \end{aligned}$$

$$\begin{aligned} 5 &= 10\% \\ \div 5 &\quad \div 5 \\ 1 &= 2\% \\ \times 3 &\quad \times 3 \\ 3 &= 6\% \\ 100\% + 6\% &= 106\% \\ 50 + 3 &= 53 \end{aligned}$$

$$\begin{aligned} 1 &= 2\% \\ \times 2 &\quad \times 2 \\ 2 &= 4\% \\ 10\% + 4\% &= 14\% \\ 5 + 2 &= 7 \\ 50 - 7 &= 43 \text{ or } 14\% \text{ less than goal.} \end{aligned}$$

$$\$45 + \$53 + \$43 = \$141$$

**Answer** \$ 141

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The money earned from ticket sales on each of the three days is correctly calculated and totaled using sound procedures. This response is complete and correct.

## GUIDE PAPER 3

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

Show your work.

Day 1	Day 2	Day 3
$\frac{x}{50} = \frac{90}{100}$ <del><math display="block">\frac{100x}{100} = \frac{4500}{100}</math></del> $x = \$45$  $45 + 53 + 43 = \$141$	$\frac{x}{50} = \frac{6}{100}$ <del><math display="block">\frac{100x}{100} = \frac{300}{100}</math></del> $x = \$3$  $50 + 3 = \$53$	$\frac{x}{50} = \frac{14}{100}$ <del><math display="block">\frac{100x}{100} = \frac{1400}{100}</math></del> $x = \$7$  $45 - 7 = \$43$

Answer \$ 141

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The money earned from ticket sales on each of the three days is correctly calculated and totaled using sound procedures. This response is complete and correct.

## GUIDE PAPER 4

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

**Show your work.**

$$= \frac{x}{50} = \frac{90}{100}$$
$$x = 45$$

$$\frac{x}{50} = \frac{106}{100}$$
$$x = 53$$

$$\frac{x}{50} = \frac{14}{100}$$
$$x = 50$$

$$50 + 53 + 45 = 148$$

**Answer** \$ 148

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The money earned from ticket sales on the first and second days is correctly calculated. A correct process is written to determine the 14% of \$50; however, an incorrect dollar amount is provided as the answer for the third day sales. The obtained answers are correctly totaled to determine the solution. This response correctly addresses only some elements of the task.

## GUIDE PAPER 5

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

**Show your work.**

$$\begin{array}{ll} 50.00 \times .90 = 45 & 50.00 + 45.00 = 95.00 \\ 50.00 \times .06 = 3 & 50.00 + 3.00 = 53.00 \\ 50.00 \times .14 = 7 & 50.00 - 7 = 43.00 \end{array}$$

**Answer** \$

191.00

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The money earned from ticket sales on the second and third days is correctly calculated; however, \$50 is inappropriately added to the first day sales when calculating the total amount earned for the three days. This response correctly addresses only some elements of the task.

## GUIDE PAPER 6

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

Show your work.

$$\frac{x}{50.00} = \frac{90}{100} = \$45$$

$$\frac{x}{50.00} = \frac{106}{100} = \$53$$

$$\frac{x}{50.00} = \frac{86}{100} = \$45.50$$

Answer \$ 55

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The money earned from ticket sales on the first day is correctly calculated. The 6% and 14% of \$50 are correctly calculated; however, the percent increase and decrease is not applied to the daily goal when computing sales on the second and third days. The obtained answers are correctly totaled to determine the solution. This response correctly addresses only some elements of the task.

## GUIDE PAPER 7

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

Show your work.

Day ①  $(50)(.9) = 45$

$50 + 45 = 95$

Day ②  $(95)(.9) = 85.50$   $50 + 95 = 180.50$

Day ③  $180.50 \cdot (.14)$

Answer \$ 119.7

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

Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The money earned from ticket sales on the first day is calculated by adding 90% of the daily goal to the daily goal, resulting in an incorrect total for this day. The second day total earnings are incorrectly calculated, and the work for the third day earnings is missing. It is unclear how the total earnings for all three days is determined.

# GUIDE PAPER 8

Additional

45

The members of a school club are selling tickets for a fundraiser. The goal for the fundraiser is to earn \$50.00 each day from ticket sales. The list below shows the percent of the goal reached each day.

- On the first day, the members earned 90% of their daily goal.
- On the second day, the members earned 6% more than their daily goal.
- On the third day, the members earned 14% less than their daily goal.

How much money, in dollars, did the members earn from ticket sales on all three days?

Show your work.

$$\begin{array}{r} \$50.00 \\ - 0.90 \\ \hline \$49.01 \end{array} \quad \begin{array}{r} \$50.00 \\ + 0.6 \\ \hline \$50.06 \end{array}$$

$$\begin{array}{r} \$50.00 \\ - 0.14 \\ \hline \$49.86 \end{array}$$

$$\begin{array}{r} 49.01 \\ + 49.86 \\ + 50.06 \\ \hline \$148.93 \end{array}$$

Answer \$ 148.93

**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. Percentages are incorrectly treated as decimal equivalents that are simply added to or subtracted from the daily goals. Also, there are calculation errors ( $\$50.00 - 0.90 \neq \$49.01$  and  $\$50.00 + 0.6 \neq \$50.06$ ).

## EXEMPLARY RESPONSE

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C:  $13$

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

*Explain your answer.*

The student first made an error in Step A. The student should not have distributed the negative sign to the numerator and denominator. The value of the expression in simplest form is  $-3$ .

Step A:  $5 - \left( \frac{40}{5} \right)$

Step B:  $5 - 8$

Step C:  $-3$

*or other valid explanation*

# GUIDE PAPER 1

Additional

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C: 13

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

***Explain your answer.***

The student first made an error in Step A. Instead of simplifying the fraction in the parentheses, he\she made the fraction positive and added 5 to it. The student should have simplified  $\frac{40}{5}$  to 8, and then subtracted 8 from five which would equal to -3.

## Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The error is correctly identified and explained, and the correct value of the expression in the simplest form is included. This response is complete and correct.

## GUIDE PAPER 2

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C:  $13$

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

*Explain your answer.*

The student made an error in Step A. The correct value is -3

Step A:  $5 - \left( \frac{40}{5} \right)$

Step B:  $5 - 8$

Step C:  $-3$

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The error is correctly identified and explained, and the correct value of the expression in the simplest form is included. This response is complete and correct.

## GUIDE PAPER 3

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C: 13

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

***Explain your answer.***

$$5 - \left( \frac{40}{5} \right)$$

5 - 8

-3

the student distributed the negative sign to both the numerator and the denominator when they should of only done one, giving the  $5 + 40/5$  instead of  $5 - 40/5$

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The step in which the student first made an error is not identified as Step A, but this is not needed as the error is clearly explained. The correct value of the expression in the simplest form is included. This response is complete and correct.

## GUIDE PAPER 4

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C: 13

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

***Explain your answer.***

He first made an error in step A. He was supposed to what was in the parenthesis first and then do the rest.  
He should have gotten -3.

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The step in which the student first made an error and the correct value of the expression in simplest form are correctly identified, but the explanation does not sufficiently explain the error. This response correctly addresses only some elements of the task.

## GUIDE PAPER 5

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C: 13

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

*Explain your answer.*

Step A because the student made the denominator negative when it should've been just the numerator

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The step in which the student first made an error is correctly identified and explained; however, the correct value of the expression in simplest form is not calculated. This response correctly addresses only some elements of the task.

## GUIDE PAPER 6

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C:  $13$

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

*Explain your answer.*

The student made an error  
in step A. They were supposed  
to divide 40 and 5 first. The  
correct answer is -3

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The step in which the student first made an error and the correct value of the expression in simplest form are correctly identified; however, the explanation insufficiently describes the error of using an incorrect sign. This response correctly addresses only some elements of the task.

## GUIDE PAPER 7

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C: 13

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

*Explain your answer.*

The boy made his first error in  
Step A the correct answer is  
3.

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

Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The step in which the student first made an error is correctly identified, but the error is not explained. An incorrect value of the expression in simplest form is provided without an explanation to support this answer.

# GUIDE PAPER 8

Additional

46

A student incorrectly simplifies an expression. The expression and the student's work are shown below.

$$5 - \left( \frac{40}{5} \right)$$

Step A:  $5 + \left( \frac{-40}{-5} \right)$

Step B:  $5 + 8$

Step C: 13

In which step did the student first make an error? Be sure to include the correct value of the expression in simplest form in your answer.

*Explain your answer.*

They messed up on step B, when they simplified  
they should have made it negative

## 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 step in which the student first made an error is incorrectly identified. The value of the expression in simplest form is not provided.

## EXEMPLARY RESPONSE

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

**Equation**  $4t = 175 - 25$

*or other equivalent equation*

What was the cost, in dollars, of each admission ticket, including tax?

**Show your work.**

$$4t = 175 - 25$$

$$4t = 150$$

$$t = 150/4$$

$$t = \$37.50$$

*or other valid work*

**Answer** \$ 37.50

# GUIDE PAPER 1

Additional

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

Equation  $t = (175 - 25) \div 4$

What was the cost, in dollars, of each admission ticket, including tax?

Show your work.

$$t = (175 - 25) \div 4$$

$$t = \$150 \div 4$$

$$t = \$37.50$$

Answer \$ 37.50

## Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. A correct equation is written, and it is correctly solved to determine the cost, in dollars, of each admission ticket. This response is complete and correct.

## GUIDE PAPER 2

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

Equation  $4x + 25 = 175$

What was the cost, in dollars, of each admission ticket, including tax?

Show your work.

$$\begin{array}{r} 4x + 25 = 175 \\ -25 \quad -25 \\ \hline 4x = 150 \\ \hline 4 \qquad 4 \\ x = 37.50 \end{array}$$

Answer \$ 37.50

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. A correct equation is written, and it is correctly solved to determine the cost, in dollars, of each admission ticket. It is acceptable to use a variable other than the suggested variable  $t$ . This response is complete and correct.

## GUIDE PAPER 3

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

**Equation**

$$t = (175 - 25) \div 4$$

What was the cost, in dollars, of each admission ticket, including tax?

**Show your work.**

$$(175 - 25) \div 4 = 37.5$$

**Answer**

\$ 37.50

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. A correct equation is written, and it is correctly solved to determine the cost, in dollars, of each admission ticket. This response is complete and correct.

## GUIDE PAPER 4

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

Equation  $4x + 25 = 175$

What was the cost, in dollars, of each admission ticket, including tax?

Show your work.

$$\begin{array}{r} 175 \\ - 25 \\ \hline \end{array}$$

$$\begin{array}{r} 150 \\ \hline 4 \end{array}$$

Answer \$ 37.5

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. A correct equation is written, and it is correctly solved to determine the cost, in dollars, of each admission ticket; however, the solution is provided in an incorrect format for money. This response contains an incorrect solution but applies a mathematically appropriate process.

## GUIDE PAPER 5

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

**Equation**

$$175 - 25 \div 4 = t$$

What was the cost, in dollars, of each admission ticket, including tax?

**Show your work.**

$$175 - 25 = 150 \div 4 =$$

**Answer**

\$ 37.50

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The cost of each admission ticket is correctly calculated. The equation is lacking the necessary parentheses, which change the order of operations, and as written would result in an incorrect solution. This response correctly addresses only some elements of the task.

## GUIDE PAPER 6

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

**Equation**

$$175 \times 4 - 25$$

What was the cost, in dollars, of each admission ticket, including tax?

**Show your work.**

$$175 - 25 = 150$$

$$150 \div 4 = 37.50 \text{ dollars per ticket.}$$

**Answer**

$$\$37.50$$

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

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The cost, in dollars, of each admission ticket is correctly calculated. An incorrect expression is provided in place of a required equation and it does not have a variable. This response correctly addresses only some elements of the task.

## GUIDE PAPER 7

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

**Equation**

$$[(175-25) \div 4] \times t$$

What was the cost, in dollars, of each admission ticket, including tax?

**Show your work.**

$$175-25=150 \div 4=37.50$$

**Answer**

$$\$ 37.50t$$

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

Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The response exhibits two distinct conceptual errors. An incorrect expression is provided in place of an equation. The multiplication symbol in the expression should be an equal sign. The second error is that although the cost of each admission ticket is correctly calculated in the work, holistically, multiplying the obtained answer by  $t$  shows no overall understanding of the task.

# GUIDE PAPER 8

Additional

47

Ms. Boi spent a total of \$175.00 for 4 admission tickets and for parking at a baseball game. The cost of each admission ticket was the same amount, including tax. The cost of parking was \$25.00. Write an equation that can be used to determine  $t$ , the cost, in dollars, of each admission ticket, including tax.

Equation  $25.00 + 4t = 175$

What was the cost, in dollars, of each admission ticket, including tax?

Show your work.

$$\begin{array}{r} 25.00 \\ \times \quad 4 \\ \hline 100.00 \\ + \underline{75.00} \\ \hline 175.00 \end{array}$$

Answer \$ 128.00

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

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect equation is provided. An incorrect solution is obtained using an obviously incorrect procedure.

## EXEMPLARY RESPONSE

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

*Show your work.*

$$4,100 + 4,100 (0.07) = 4,100 + 287 = 4,387 \text{ bottles}$$

$$4,387 + 500 = 4,887 \text{ bottles}$$

$$(4,887 - 4,100) / 4,100 = 787 / 4,100 \approx 0.191951219 \approx 19\%$$

*or*

$$4,100 + 4,100 (0.07) = 4,100 + 287 = 4,387 \text{ bottles}$$

$$4,387 + 500 = 4,887 \text{ bottles}$$

$$4,887 / 4,100 \approx 1.191951219, \text{ which is a } 19\% \text{ increase}$$

*or*

$$4,100 (0.07) = 287 \text{ bottles}$$

$$287 + 500 = 787 \text{ bottles}$$

$$787 / 4,100 \approx 0.191951219 \approx 19\%$$

*or*

$$500 / 4,100 \approx 0.121951219 \approx 12\%$$

$$12\% + 7\% \approx 19\%$$

*or other valid process*

**Answer** 19 %

# GUIDE PAPER 1

Additional

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

*Show your work.*

$$\begin{aligned}4100 \times 1.07 &= 4387 \\4387 + 500 &= 4887 \\(4887 - 4100) \div 4100 &= 19\%\end{aligned}$$

**Answer**

19

%

## Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The percent increase, to the nearest percent, in the number of water bottles manufactured from February to April is correctly calculated using sound procedures. This response is complete and correct.

## GUIDE PAPER 2

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

Show your work.

$$F: 4,100$$

$$41861 - 4100 = 181$$

$$M: 7\% \text{ of } 4,100 = 287$$

$$4,100 + 287 = 4,387$$

$$\frac{787}{4,100} = \frac{x}{100}$$

$$A: 4387 + 500 = 4887$$

$$\frac{4100x = 18700}{4100}$$

$$x = 19$$

Answer 19 %

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The percent increase, to the nearest percent, in the number of water bottles manufactured from February to April is correctly calculated using sound procedures. This response is complete and correct.

## GUIDE PAPER 3

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

*Show your work.*

$$\begin{aligned}4100 \times 7\% &= 287 \\4100 + 287 &= 4387 \\4387 + 500 &= 4887 \\(\text{I guessed until I got the answer}) \\19\% \times 4100 &= 779 \\4100 + 779 &= 4879\end{aligned}$$

**Answer**

19%   %

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

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The percent increase, to the nearest percent, in the number of water bottles manufactured from February to April is correctly calculated using sound procedures. A valid trial and error process is used to determine the percent increase. This response is complete and correct.

## GUIDE PAPER 4

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

**Show your work.**

FEBRUARY

4100 bottle

$$x = 19.2$$

percent increase

$$\frac{787}{4100} = \frac{x}{100}$$

MARCH

$$\frac{x}{4100} = \frac{107}{100} \text{ (cross multiply)}$$

$$\frac{100x}{100} = \frac{438700}{100}$$

$$x = 4387$$

APRIL

$$4387 + 500 = 4887$$

**Answer**

19.2

%

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

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The percent increase in the number of water bottles manufactured from February to April is correctly calculated using sound procedures; however, the solution is not rounded to the nearest whole percent. This response addresses most but not all aspects of the task using mathematically sound procedures.

## GUIDE PAPER 5

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

**Show your work.**

$$\begin{aligned}4100 \times .07 &= 287 \\287 + 500 &= 787 \\4100 \div 787 &= 0.191 = .19 = 19\%\end{aligned}$$

**Answer**

19%

%

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

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The percent increase, to the nearest percent, in the number of water bottles manufactured from February to April is correctly calculated using sound procedures; however, the division is written in an incorrect order. This response reflects a minor misunderstanding of the underlying mathematical procedures.

## GUIDE PAPER 6

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

Show your work.

$$\begin{aligned}4100 \cdot 1.07 &= 4387 \\4100 + 4387 &= 4887 \\4387 + 500 &= 4887 \\4887 - 4100 &\quad \frac{787}{4100} \\&= 0.19\end{aligned}$$

Answer 0.19 %

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

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The percent increase in the number of water bottles manufactured from February to April is correctly calculated using sound procedures; however, the solution is not rounded to the nearest whole percent. This response addresses most, but not all, aspects of the task using mathematically sound procedures.

## GUIDE PAPER 7

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

**Show your work.**

$$F: 4,100$$

$$M: 4100 \times 0.7 + 4,100$$

$$M: 6970$$

$$A: 6970 + 500$$

$$A: 7470$$

Regular percent decrease to find out the answer: #  $\times$  percent – #

$$\text{This problem: } 7470 - 4100 = 3370 \div 4100 = 0.82 = 82\%$$

**Answer**

82

%

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

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. A correct process is used to calculate the percent increase, to the nearest percent, in the number of water bottles manufactured from February to April; however, 0.7 is incorrectly used in place of 0.07 to determine the 7% more water bottles in March, which is a conceptual error. Per Scoring Policy #8, if the student makes a conceptual error, the student shall not receive more than 50% credit. This response reflects a lack of essential understanding of the underlying concepts.

# GUIDE PAPER 8

Additional

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

*Show your work.*

$$4100 \times 7\% = 287$$

$$4100 + 287 = 4387$$

$$4387 + 500 = 4887$$

$$4100 \div 4887$$

Answer 16 %

## Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. A correct process is used to calculate the total number of bottles in March and April; however, the percent increase is incorrectly determined when dividing the monthly amounts. This response reflects a lack of essential understanding of the underlying concepts.

## GUIDE PAPER 9

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

**Show your work.**

$$4100 \times .07 = 287 + 500 = 787$$

**Answer**

787

%

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

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. A correct process is used to calculate the increase in the number of bottles from February to April, which is incorrectly provided as the percent increase. This response addresses some elements of the task correctly but reaches an inadequate solution.

# GUIDE PAPER 10

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

Show your work.

$$\begin{array}{r} 4100 + 7\% = 41,00.07 \\ + 500 \\ \hline 4600.07 \end{array}$$

4600.07

Answer 46 %

## 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. An incorrect solution is obtained using an obviously incorrect procedure.

# GUIDE PAPER 11

Additional

48

A company manufactures water bottles. The list below describes the number of water bottles manufactured in three months.

- February: 4,100 water bottles
- March: 7% more water bottles than in February
- April: 500 more water bottles than in March

What is the percent increase, to the nearest percent, in the number of water bottles the company manufactured from February to April?

*Show your work.*

$$4,100 \div 100 = 41 \quad \begin{array}{r} \times \frac{41}{7} \\ \hline 287 \end{array} \quad \begin{array}{r} + 4,100 \\ 287 \\ \hline 4,387 \end{array} \quad 4,387 \div 500 = 8.774$$

**Answer**

8.774

%

## 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 the total number of bottles for March is correctly calculated, the April amount is not addressed, and dividing the March amount by 500 to determine the total percent increase demonstrates that, holistically, there is no understanding.