

# Colorado Measures of Academic Success



## Grade 4 Mathematics



Paper Practice Resource for Students



## Paper Practice Resource for Students

The Colorado Measures of Academic Success (CMAS) is Colorado’s standards-based assessment program designed to measure the Colorado Academic Standards (CAS) in the content areas of science, social studies, English language arts, and mathematics. The sample items included in this resource provide students with an opportunity to become familiar with the format of test items that appear in the paper-based test books.

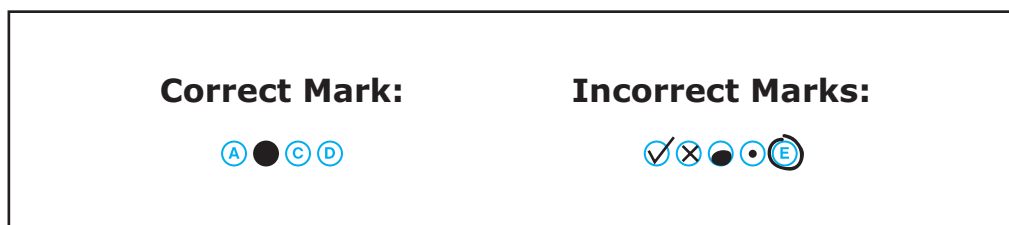
While the use of the sample items is not required, it is strongly encouraged to help ensure students are familiar with the types of items they may encounter while taking the paper-based test.

The sample item sets in the CMAS Practice Resources are not intended to be representative of a complete unit or test, nor are they intended to cover all assessed content or item types. To view assessment frameworks, high level blueprints, scoring rubrics, evidence statements and standards for the CMAS assessments, visit: [https://www.cde.state.co.us/assessment/cmas\\_testdesign](https://www.cde.state.co.us/assessment/cmas_testdesign).

### Item Types:

#### Selected Response Items

Selected response items are multiple choice questions. To respond, the student indicates their response in an answer grid or by filling in the circle(s) next to their answer choice.



#### Constructed Response Items

Constructed response items are questions or prompts that require an independent, written response. To respond, the student writes his or her answer in the response box in the test book.

## **Converted Online Technology-Enhanced Item Types**

Online technology-enhanced items converted to the paper testing format may ask students to:

- Circle the correct answer
- Complete a table with checkmarks, Xs, or letters from a list of answer choices
- Fill in the blank
- Draw lines from boxes to correct answers
- Complete a bar graph or histogram
- Interact with a number line
- Graph points and lines on a coordinate grid
- Divide and shade shapes to indicate fractions

# Directions for Completing the Answer Grids

- 1. Work the problem and find an answer.
- 2. Write your answer in the boxes at the top of the grid.
- 3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
- 4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
- 5. Do not fill in a circle under an unused box.
- 6. Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
- 7. See below for examples on how to correctly complete an answer grid.

## EXAMPLES

To answer 632 in a question, fill in the answer grid as shown below.

6	3	2			
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0
<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1
<input type="radio"/> 2	<input type="radio"/> 2	<input checked="" type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2
<input type="radio"/> 3	<input checked="" type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3
<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4
<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5
<input checked="" type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6
<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7
<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8
<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9

To answer .75 in a question, fill in the answer grid as shown below.

.	7	5			
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0
<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1
<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2
<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3
<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4
<input type="radio"/> 5	<input type="radio"/> 5	<input checked="" type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5
<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6
<input type="radio"/> 7	<input checked="" type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7
<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8
<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9

OR

0	.	7	5		
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 0
<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1	<input type="radio"/> 1
<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2	<input type="radio"/> 2
<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3	<input type="radio"/> 3
<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4	<input type="radio"/> 4
<input type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5	<input checked="" type="radio"/> 5	<input type="radio"/> 5	<input type="radio"/> 5
<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6	<input type="radio"/> 6
<input type="radio"/> 7	<input type="radio"/> 7	<input checked="" type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7	<input type="radio"/> 7
<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8	<input type="radio"/> 8
<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9	<input type="radio"/> 9



# ITEM SET 1

1. What fraction, when added to  $\frac{3}{8}$ , would make one whole?

(A)  $\frac{3}{8}$

(B)  $\frac{5}{8}$

(C)  $\frac{6}{8}$

(D)  $\frac{8}{8}$

2. Which values are factor pairs of 80?

Place a check mark (✓) to classify each factor pair. Select **one** box per row.

Factor Pair	Factor Pair of 80	Not a Factor Pair of 80
$8 \times 0$	<input type="checkbox"/>	<input type="checkbox"/>
$2 \times 40$	<input type="checkbox"/>	<input type="checkbox"/>
$20 \times 4$	<input type="checkbox"/>	<input type="checkbox"/>
$40 \times 40$	<input type="checkbox"/>	<input type="checkbox"/>
$1 \times 80$	<input type="checkbox"/>	<input type="checkbox"/>
$10 \times 8$	<input type="checkbox"/>	<input type="checkbox"/>
$20 \times 60$	<input type="checkbox"/>	<input type="checkbox"/>
$5 \times 16$	<input type="checkbox"/>	<input type="checkbox"/>



3. What is the value of  $96 \times 30$ ?

Enter your answer in the box.

•	•	•	•	•	•
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Use the information provided to answer Part A and Part B for question 4.

Three people play a video game.

- Person A scores 3,793 points.
- Person B scores 4,286 points.
- Person C scores 5,941 points.

**4. Part A**

How many points do the three people have in total?

- Ⓐ 12,710
- Ⓑ 13,020
- Ⓒ 13,920
- Ⓓ 14,020

**Part B**














How many more points do Person A and Person C have together than Person B?

- Ⓐ 5,448
- Ⓑ 5,552
- Ⓒ 6,434
- Ⓓ 6,574

**TURN THE PAGE AND  
CONTINUE WORKING**

5. A person made a picture graph to represent the color of the cars in a model car collection.

### Model Cars

Color	Number of Cars
Black	?
Blue	     
Red	  
Yellow	   

### KEY

Each  equals 3 model cars.

- There are a total of 6 black cars. How many cars should be used to represent the number of black cars on the graph? Use an equation or equations to show your work.
- How many fewer yellow cars are there than the sum of red and blue cars together? Use an equation or equations to show your work.
- Write an equation or equations to find the total number of cars in the collection.

Enter your answers and your equations in the space provided.

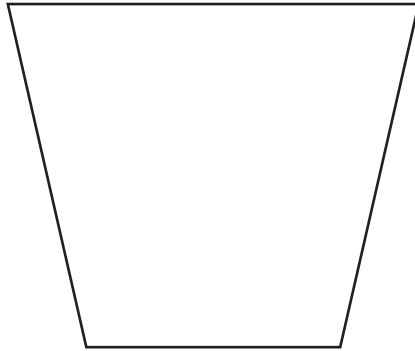
6. What is the sum of 7,261 and  $1,000 + 500 + 30 + 2$ ?

Write **one** number from the list provided into each blank box to show the sum using place value. Each number may be used once, more than once, or not at all.

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

<input type="text"/>	thousands	<input type="text"/>	hundreds	<input type="text"/>	tens	<input type="text"/>	ones
----------------------	-----------	----------------------	----------	----------------------	------	----------------------	------

7. Look at this shape.



In what **two** ways can the shape be classified?

Select the **two** correct answers.

- ☐ A parallelogram
- ☐ B quadrilateral
- ☐ C rectangle
- ☐ D rhombus
- ☐ E square
- ☐ F trapezoid<sup>1</sup>

<sup>1</sup>trapezoid—a quadrilateral with at least one pair of parallel sides

8. A farmer plants 4 rows of trees. Each row has an equal number of trees. There are 1,580 trees on the farm.

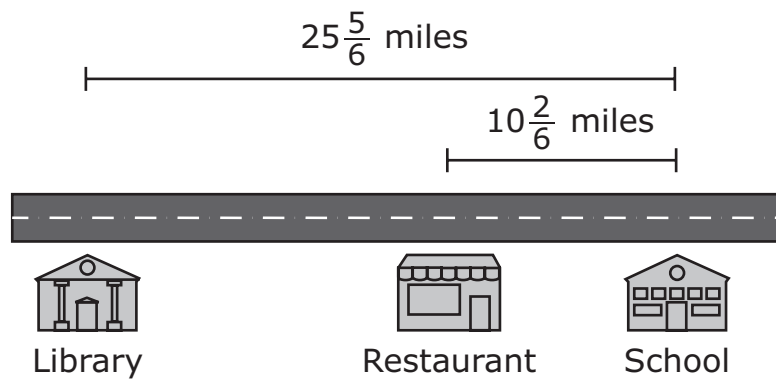
What is the number of trees in each row?

Enter your answer in the box.

•	•	•	•	•	•
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9



9. A street in a town is shown.



- Write an expression to find the distance, in miles, between the restaurant and the library.
- What is the difference, in miles, between the restaurant and the library?

Enter your expression and your answer in the space provided. Enter **only** your expression and your answer.

**Expression:** \_\_\_\_\_

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

**10.** The state fair kept track of how many visitors it had during a 4-day period. The total amount of visitors for each day is shown.

- Friday: 19,809
- Saturday: nineteen thousand, seven hundred eight
- Sunday:  $10,000 + 9,000 + 800 + 70 + 8$
- Monday:  $10,000 + 9,000 + 800 + 9$

Circle the correct answer option to complete each of the sentences.

The number of visitors on Friday is \_\_\_\_ the number of visitors on Sunday.

>
=
<

The number of visitors on Sunday is \_\_\_\_ the number of visitors on Saturday.

>
=
<

The number of visitors on Monday is \_\_\_\_ the number of visitors on Friday.

>
=
<

**TURN THE PAGE AND  
CONTINUE WORKING**

Use the information provided to answer Part A and Part B for question 11.

A person has four different pieces of string that have lengths of  $\frac{4}{8}$  foot,  $\frac{2}{6}$  foot,  $\frac{4}{5}$  foot, and  $\frac{8}{12}$  foot.

**11. Part A**

Which list orders the lengths of the pieces of strings from shortest to longest?

- ☐ A  $\frac{4}{5}, \frac{2}{6}, \frac{4}{8}, \frac{8}{12}$
- ☐ B  $\frac{2}{6}, \frac{4}{8}, \frac{8}{12}, \frac{4}{5}$
- ☐ C  $\frac{4}{5}, \frac{8}{12}, \frac{4}{8}, \frac{2}{6}$
- ☐ D  $\frac{2}{6}, \frac{4}{5}, \frac{4}{8}, \frac{8}{12}$

## Part B

A person cuts another piece of string that is  $\frac{8}{12}$  foot long.

Which equivalent fractions can represent the length of the piece of string?

Select the **two** correct fractions.

☐ A  $\frac{1}{5}$

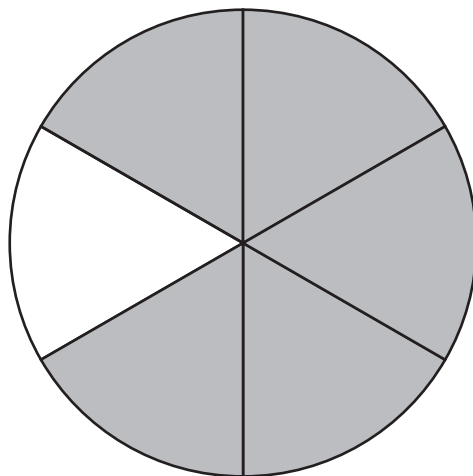
☐ B  $\frac{6}{10}$

☐ C  $\frac{2}{3}$

☐ D  $\frac{4}{6}$

☐ E  $\frac{8}{10}$

- 12.** The fraction model shows  $\frac{5}{6}$ .



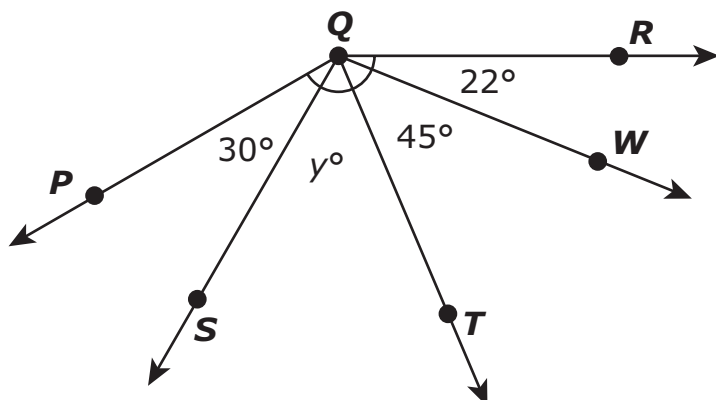
A student says that the model also shows a fraction that is equal to  $\frac{7}{8}$  because  $\frac{5+2}{6+2} = \frac{7}{8}$ .

- Explain the mistake the student made.
- Explain how to correct the mistake the student made.
- Include a fraction that is equal to  $\frac{5}{6}$  in your explanation.

Enter your explanations and your answer in the space provided.

Use the information provided to answer Part A and Part B for question 13.

The measure of angle  $PQR$  is  $150^\circ$ .



### 13. Part A

What is the measure, in degrees, of angle  $TQR$ ?

Enter your answer in the box.

0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9



**Part B**

What is the measure, in degrees, of angle  $PQT$ ?

- ☐ A 53
- ☐ B 75
- ☐ C 83
- ☐ D 97

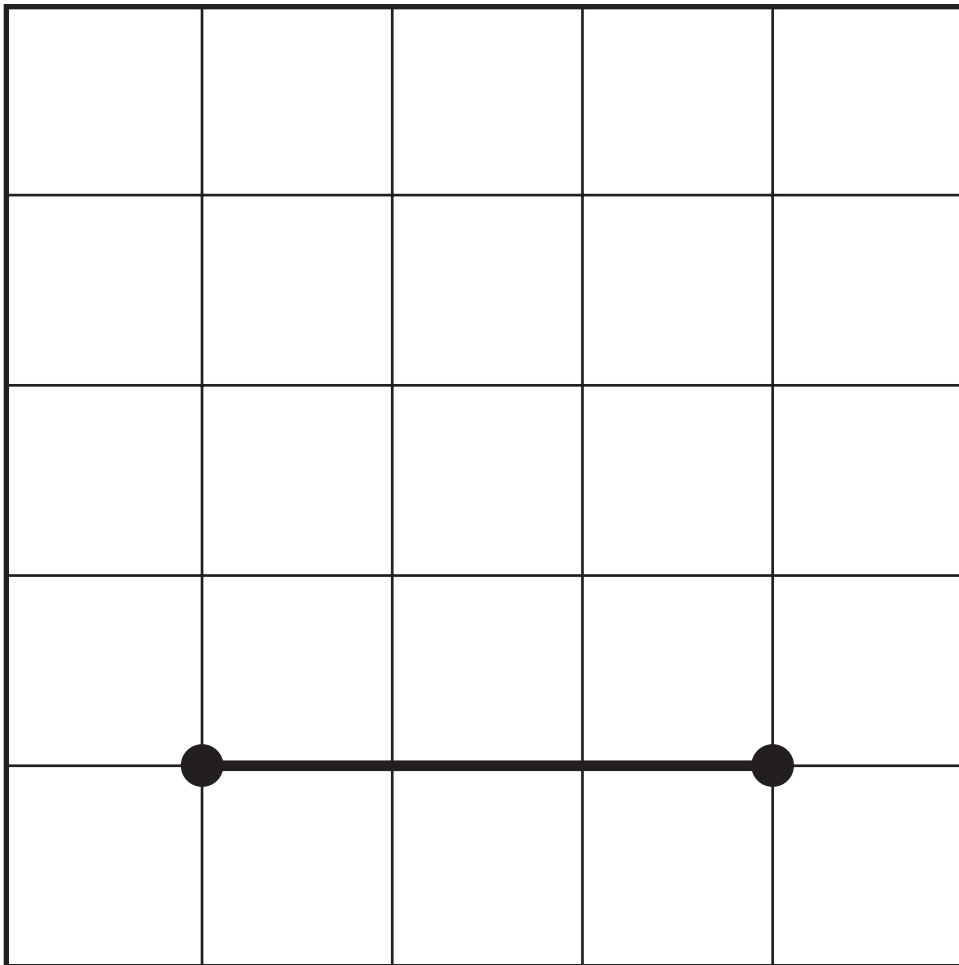
**This is the end of Item Set 1.**



# ITEM SET 2

1. Create a line segment parallel to the given line segment.

Plot **two** points on the coordinate grid, and then draw a line through the points.



Use the information provided to answer Part A and Part B for question 2.

A photographer has a picture album that holds 100 pictures. The photographer fills  $\frac{57}{100}$  of the album with pictures of trees. She fills  $\frac{30}{100}$  of the album with pictures of animals.

**2. Part A**

What fraction of the album is filled with either pictures of trees or animals?

(A)  $\frac{27}{100}$

(B)  $\frac{54}{100}$

(C)  $\frac{60}{100}$

(D)  $\frac{87}{100}$

**Part B**

The photographer fills  $\frac{9}{100}$  of the album with pictures of flowers.

What decimal represents the part of the album that is filled with flowers?

(A) 0.009

(B) 0.09

(C) 0.90

(D) 1.09

3. Which two numbers are prime numbers?

Select the **two** correct answers.

- ☐ A 27
- ☐ B 37
- ☐ C 57
- ☐ D 67
- ☐ E 77

4. The value of the digit 6 in the number 3,694 is equal to 600.

Write the correct numbers from the list in the blank boxes to show the correct values of the digit 6. Each number may be used once, more than once, or not at all.

6

60

600

6,000

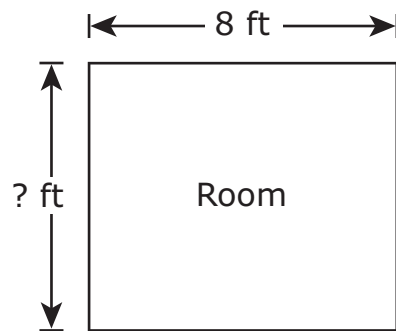
When moved one place to the left, the value of the digit 6

in the number 3,694 would equal  .

When moved one place to the right, the value of the digit 6

in the number 3,694 would equal  .

5. The length of a rectangular room is 8 feet. The area of the room is 56 square feet.



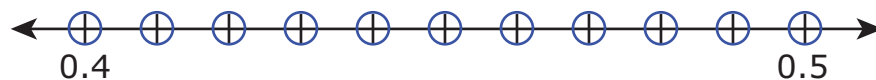
What is the perimeter, in feet, of the room?

Enter your answer in the box.

0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

6. Where is  $\frac{42}{100}$  located on the number line?

Fill in **one** circle on the number line to plot the point.



7. A baker has cupcake pans that can hold 12 cupcakes each. The baker made 9 cupcake pans full of vanilla cupcakes and 4 cupcake pans full of strawberry cupcakes.

The baker then puts the cupcakes into boxes. The baker puts 8 cupcakes in each box.

What is the **fewest** number of boxes the baker will need for all the cupcakes?

- Ⓐ 18
- Ⓑ 20
- Ⓒ 24
- Ⓓ 32



**TURN THE PAGE AND  
CONTINUE WORKING**

Use the information provided to answer Part A and Part B for question 8.

The table shows the items and amounts needed to make 1 bottle of bubble mix. The two items in a bubble mix are water and dish soap.

**Bubble Mix**

Item	Amount
water	$\frac{5}{8}$ cup
dish soap	$\frac{2}{8}$ cup

**8. Part A**

How much more water than dish soap is needed to make 1 bottle of bubble mix?

Enter your answer in the space provided. Enter **only** your answer.

<div></div>	cup
<div></div>	

**Part B**

A student wants to make enough bubble mix for 7 bottles.

- How many cups of bubble mix does the student need to make to fill 7 bottles? Include in your answer the number of cups of water and the number of cups of dish soap the student needs.
- Explain your answer or show your work.

Enter your answers and your work or explanation in the space provided.

**This is the end of Item Set 2.**



# ITEM SET 3

- 1.** A store has two lamps for sale. Lamp A costs \$9. Lamp B costs 6 times more than Lamp A.

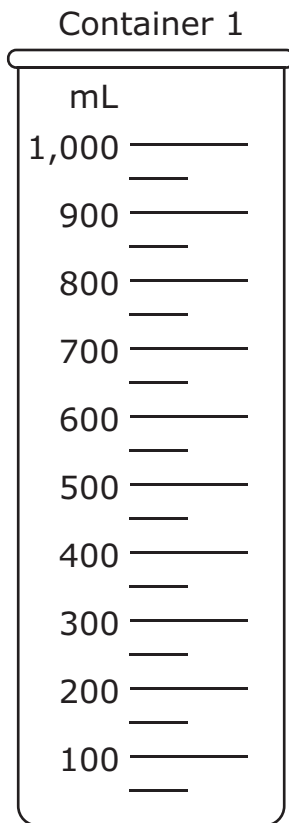
How much is Lamp B?

- ☐ A \$3
- ☐ B \$15
- ☐ C \$45
- ☐ D \$54

2. A student has an unknown amount of water in Container 1. She pours the amount into Container 2, which already has 450 milliliters of water inside. After she combines the two amounts, there is a total of 1 liter of water in Container 2.

What was the original amount of water, in milliliters, in Container 1 before the student combined the two amounts?

Draw a line and shade the container to the correct height.



3. A person went on a hike that lasted 3 hours.

How many minutes was the hike?

Enter your answer into the box.

•	•	•	•	•	•
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

4. A group of 63 birds is 9 times more than a group of 7 birds.

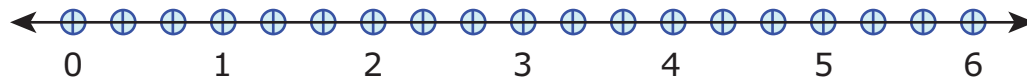
Which equation has the same meaning as this statement?

- (A)  $63 = 9 \times 7$
- (B)  $7 = 63 \times 9$
- (C)  $7 = 9 \div 63$
- (D)  $63 = 7 \div 9$



5. What number on the number line represents the value of  $2 \times \frac{2}{3}$ ?

Fill in the circle on the number line to plot the point.



6. Two friends each have a piece of yarn that is  $\frac{2}{10}$  meter long.

Friend A says that  $\frac{2}{10}$  meter is equivalent to  $\frac{4}{12}$  meter because

$$\frac{2}{10} = \frac{2+2}{10+2} = \frac{4}{12}.$$

Friend B says that  $\frac{2}{10}$  meter is equivalent to  $\frac{2}{5}$  meter because

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

- Explain the mistake that Friend A made.
- Explain the mistake that Friend B made.
- Show a fraction that is equivalent in length to  $\frac{2}{10}$  meter. Show or explain your work.

Enter your explanations and your answer in the space provided.

7. There are 3,726 students spending the summer at a camp. The students are divided equally into 9 groups.

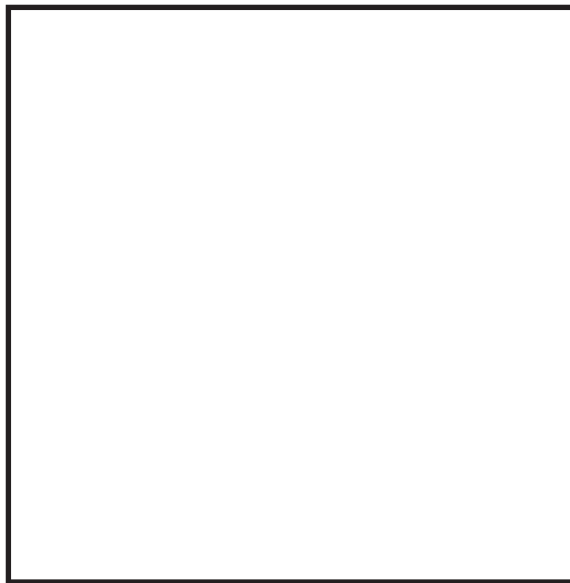
How many students are in each group?

- ☐ A 302
- ☐ B 414
- ☐ C 482
- ☐ D 512

8. Create a fraction model with a denominator of 10 that is equivalent to

$$\frac{70}{100}.$$

Divide the figure into the correct number of equal parts. Then shade the correct number of parts.



**This is the end of Item Set 3.**



