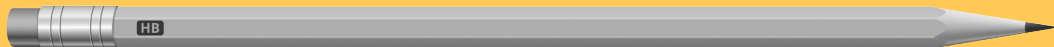


# Colorado Measures of Academic Success



## Grade 7 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.

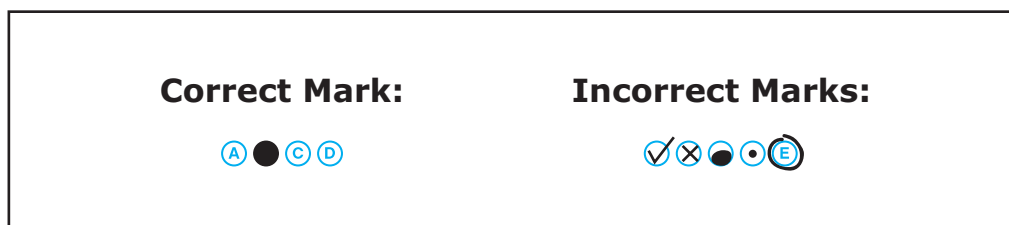
While the use of the sample items is not required, it is strongly encouraged to help ensure students are familiar with the types of items they may encounter while taking the paper-based test.

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  $-3$  in a question, fill in the answer grid as shown below.

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

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OR

|                                  |                       |                       |                       |                       |                       |
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# ITEM SET 1 - SECTION 1 (Non-Calculator)

**Directions:**

This Item Set has two sections: a non-calculator section and a calculator section. You will now take the non-calculator section. You may not use a calculator.



1. Which expression is equivalent to  $\frac{1}{2} - \frac{3}{5}$ ?

Ⓐ  $-\frac{3}{5} + \left(-\frac{1}{2}\right)$

Ⓑ  $-\frac{1}{2} + \left(\frac{3}{5}\right)$

Ⓒ  $\frac{1}{2} + \left(-\frac{3}{5}\right)$

Ⓓ  $\frac{3}{5} + \left(\frac{1}{2}\right)$

2. In 1 year, the water level of a lake changes by  $-\frac{3}{8}$  inch.

If the water level of the lake continues to change at this rate for 7 years, how many inches will the water level of the lake have changed?

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

---



3. In one hour, Earth travels approximately 67,000 miles in its orbit around the Sun.

Which equation represents the relationship between the total number of miles,  $m$ , that Earth travels in  $h$  hours?

- ☐ A  $67,000 + m = h$
- ☐ B  $67,000 + h = m$
- ☐ C  $67,000m = h$
- ☐ D  $67,000h = m$

4. Create an expression that has the same value as  $(6x - 4) + (x + 5)$ .

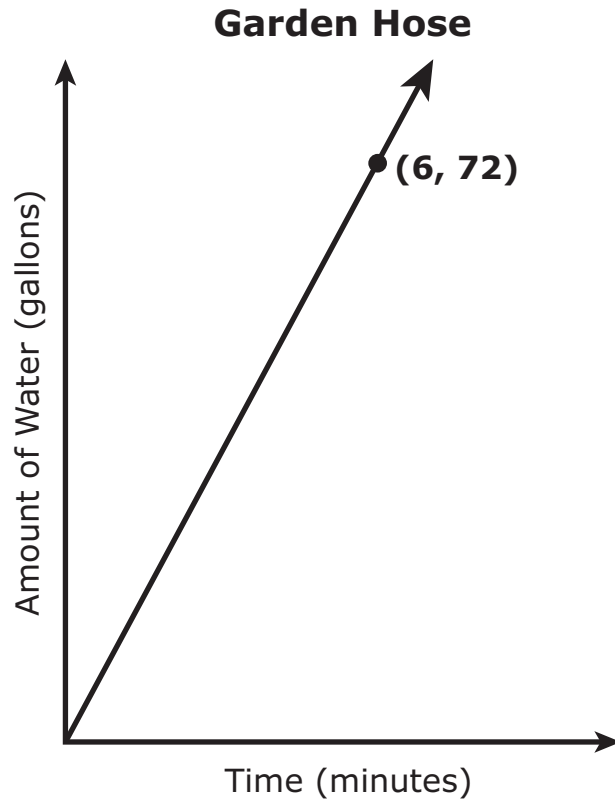
Write the correct numbers from the list in the blank boxes. Each number may be used once, more than once, or not at all.

|   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|----|
| 1 | 2 | 4 | 5 | 6 | 7 | 9 | 11 |
|---|---|---|---|---|---|---|----|

|  |            |  |
|--|------------|--|
|  | $\times +$ |  |
|--|------------|--|



5. The graph represents the amount of water, in gallons,  $y$ , that flows through a garden hose in  $x$  minutes.



Which statement correctly describes the meaning of the point shown on this graph?

- Ⓐ Every 6 minutes, 72 gallons of water flow through the hose.
- Ⓑ Every 72 minutes, 6 gallons of water flow through the hose.
- Ⓒ Every 6 minutes, 12 gallons of water flow through the hose.
- Ⓓ Every 12 minutes, 6 gallons of water flow through the hose.



6. Store A has meat on sale for  $1\frac{1}{2}$  lbs for \$5.34. The table shows the prices for meat at three nearby stores.

Place a check mark (✓) to identify how the price of the meat at each nearby store compares to the price of the meat at Store A. Select **one** box per row.

| Price at Nearby Store | less than the price at Store A | equal to the price at Store A | greater than the price at Store A |
|-----------------------|--------------------------------|-------------------------------|-----------------------------------|
| 0.5 lb for \$1.78     | <input type="checkbox"/>       | <input type="checkbox"/>      | <input type="checkbox"/>          |
| 1.3 lbs for \$4.94    | <input type="checkbox"/>       | <input type="checkbox"/>      | <input type="checkbox"/>          |
| 2.5 lbs for \$8.70    | <input type="checkbox"/>       | <input type="checkbox"/>      | <input type="checkbox"/>          |

7. Which expression is equivalent to  $-\frac{3}{5}\left(7 - 3\frac{1}{3}\right)$ ?

- Ⓐ  $\left(-\frac{3}{5}\right)(-7) + \left(-\frac{3}{5}\right)\left(-3\frac{1}{3}\right)$
- Ⓑ  $-\left(-\frac{3}{5}\right)(7) - \left(-\frac{3}{5}\right)\left(3\frac{1}{3}\right)$
- Ⓒ  $-\left(-\frac{3}{5}\right)(7) - \left(-\frac{3}{5}\right)\left(-3\frac{1}{3}\right)$
- Ⓓ  $\left(-\frac{3}{5}\right)(7) + \left(-\frac{3}{5}\right)\left(-3\frac{1}{3}\right)$



8. A person paid a total of \$38.50, before tax, for flowers and dirt at a store. The price of the flowers was \$4.50 per container. The price of the dirt was \$7.00 per bag.

If the customer bought one bag of dirt, how many containers of flowers did the customer buy?

- (A) 5
- (B) 7
- (C) 9
- (D) 10

9. Which expression is equivalent to  $-\frac{1}{5}(y - 3) + 5 + \frac{3}{10}y$ ?

Select **all** expressions that are equivalent.

- (A)  $-\frac{1}{5}y + 5\frac{3}{5} + \frac{3}{10}y$
- (B)  $-\frac{1}{5}y + 4\frac{2}{5} + \frac{3}{10}y$
- (C)  $\frac{1}{10}y + 5\frac{3}{5}$
- (D)  $\frac{1}{2}y + 4\frac{2}{5}$
- (E)  $\frac{1}{10}y + 2$



**10.** A student spent \$18 for a haircut this week.

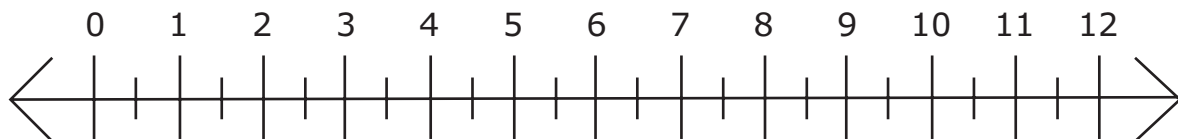
Which event, when combined with the student spending \$18, will result in the student having \$0 remaining?

- ☐ A The student earned \$18 for cleaning out his neighbor's garage.
- ☐ B The student paid his little brother \$18 for doing his chores.
- ☐ C The student purchased a gift for his mom for \$18.
- ☐ D The student gave \$18 to a friend.

**11.** A student wants to walk 30 or more total miles this month and has already walked 18 of the 30 total miles. The student walks at a constant speed of 3 miles per hour.

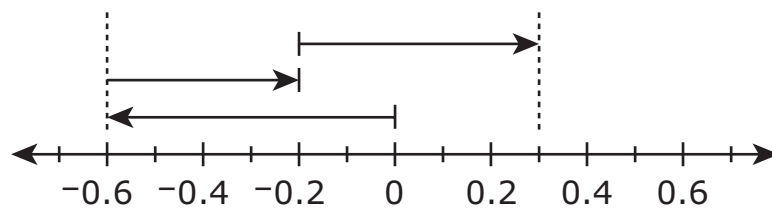
Graph  $n$ , all the possible values for the number of additional hours it will take the student to walk at least 30 total miles this month.

Select a ray and then graph the ray so that it begins at the correct place on the number line.





**12.** The number line model can be used to represent an expression.



Which expression represents the number line model?

- ☐ A  $-0.6 + -0.4 + 0.5$
- ☐ B  $-0.6 + 0.4 + 0.5$
- ☐ C  $-0.6 - 0.3$
- ☐ D  $0.3 - -0.6$

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





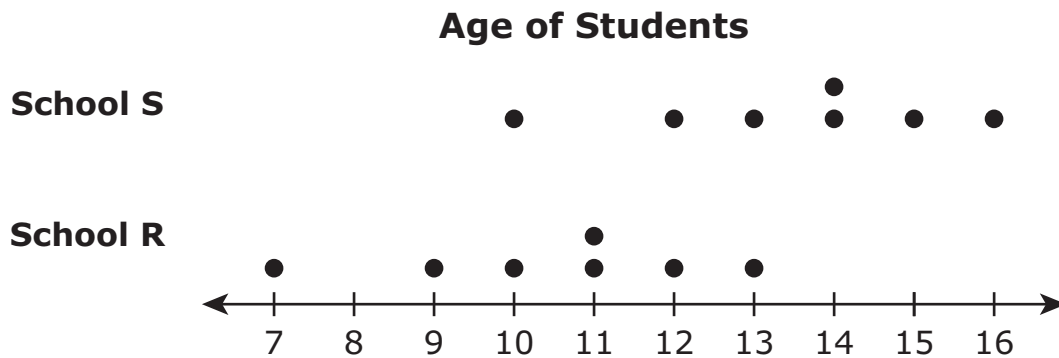
# ITEM SET 1 - SECTION 2 (Calculator)

You may use a calculator for Item Set 1 - Section 2.





13. Students from two schools attend a game tournament. Data about the age of the students from each school are shown in the line plot.



The mean age, in years, of the students from School R is 10.4. The mean age, in years, of the students from School S is 13.4. The mean absolute deviation for each group of students is about 1.5.

Circle the answer options to correctly complete the sentence.

The difference between the mean ages is \_\_\_\_\_ ,

- 3

8.9

11.9

which is about \_\_\_\_\_ times the mean absolute deviation

- 0.5

2

for either school.

**This is the end of Item Set 1 Section 2.**





# ITEM SET 2 (Calculator)

You may use a calculator for Item Set 2.





## 1. Part A

Consider the expression  $\frac{1}{2}x + 3 + \frac{1}{3}x - 4$ .

Write an equivalent expression with exactly two terms.

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

---

## Part B

A student states that the expressions  $\frac{1}{2}(x + 3) + \frac{1}{3}(x - 4)$  and  $\frac{1}{2}x + 3 + \frac{1}{3}x - 4$  are equivalent.

- Explain why the student's reasoning is incorrect.
- Create an expression, with two terms, that is equivalent to  $\frac{1}{2}(x + 3) + \frac{1}{3}(x - 4)$ . Show your work or explain your reasoning.

Enter your explanations or work and your answer in the space provided.





2. A person can play  $\frac{1}{6}$  of a song in  $\frac{1}{3}$  of a minute.

How many minutes does it take the person to play the whole song once at this rate?

(A) 3

(B) 2

(C)  $\frac{2}{3}$

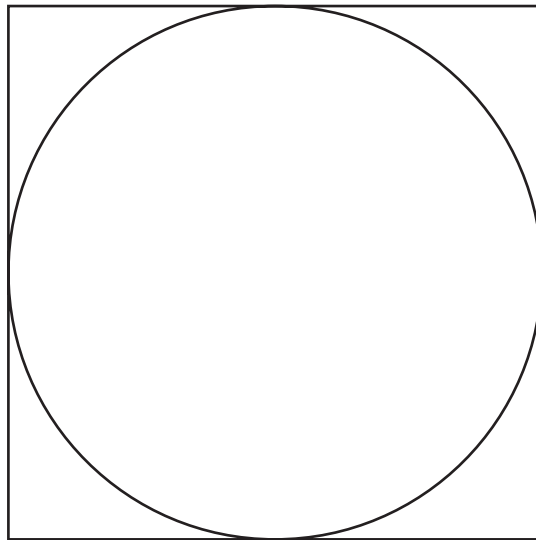
(D)  $\frac{1}{2}$





Use the information provided to answer Part A and Part B for question 3.

A circle is inscribed on a square piece of paper. The radius of the circle is 5 centimeters.



**3. Part A**

What is the circumference, in centimeters, of the circle?

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

\_\_\_\_\_ **centimeters**

**Part B**

The circle is cut out and removed from the square. How much paper, in square centimeters, remains after the circle is removed?

- (A)  $25\pi - 10$
- (B)  $10\pi - 25$
- (C)  $100 - (10\pi)$
- (D)  $100 - (25\pi)$



**TURN THE PAGE AND  
CONTINUE WORKING**





Use the information provided to answer Part A through Part D for question 4.

A 50-pound bag of dog food contains 200 cups of food.

- A large dog eats 14 cups of food in 4 days.
- A small dog eats 9 cups of food in 6 days.

The daily serving size of dog food for each dog is constant.

#### 4. Part A

Both dogs are fed from a new 50-pound bag of dog food.

What fraction of the new bag remains after 30 days?

(A)  $\frac{1}{4}$

(B)  $\frac{19}{40}$

(C)  $\frac{3}{4}$

(D)  $\frac{31}{40}$

#### Part B

How many complete daily servings for the large dog are in a 28-pound bag of dog food?

Enter your answer in the box.

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|---|---|---|---|---|---|
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| 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 C

The owner uses a scoop to pour the food into each dog's bowl. A 1-day serving of food for the large dog requires 7 scoops of dog food.

Based on the ratio of 1-day servings for each dog, how many scoops are needed to serve the small dog a 1-day serving of food?

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

**Small dog's 1-day serving:** \_\_\_\_\_ **scoops**

### Part D

A medium dog eats 11 cups of dog food in 4 days.

How many more cups of food does the large dog eat compared to the medium dog in 90 days?

- ☐ A 270
- ☐ B 180
- ☐ C 112.5
- ☐ D 67.5





5. A researcher wants to predict the number of deer at a park based on the size of the park. The table shows data collected about the size, in acres, and the current number of deer at several parks.

**Park Data**

| Park Name | Size (acres) | Number of Deer |
|-----------|--------------|----------------|
| Johnson   | 1,980        | 195            |
| Kennedy   | 1,590        | 162            |
| Lincoln   | 1,720        | 168            |
| Roosevelt | 2,050        | 201            |
| Taft      | 2,060        | 198            |

- Use the data to find an estimated rate of deer per acre for any park. Explain how you determined your estimate.
- Create an equation to model the estimated number of deer,  $d$ , that exist in  $n$  acres of a park.

Enter your answer, your explanation, and your equation in the space provided.





Use the information provided to answer Part A and Part B for question 6.

A reporter from the school paper asks a random sample of students about their favorite school food. The results are shown in the table. There are 441 students in total at the school.

**Favorite School Food**

| <b>Favorite School Food</b> | <b>Number of Students</b> |
|-----------------------------|---------------------------|
| spaghetti                   | 12                        |
| salad                       | 15                        |
| hamburger                   | 11                        |
| pizza                       | 20                        |
| other                       | 5                         |

**6. Part A**

Based on the sample, approximately how many students in the entire school population prefer spaghetti as their favorite school food?

- (A) 12
- (B) 63
- (C) 84
- (D) 105

**Part B**

Based on the sample, which inference can be made?

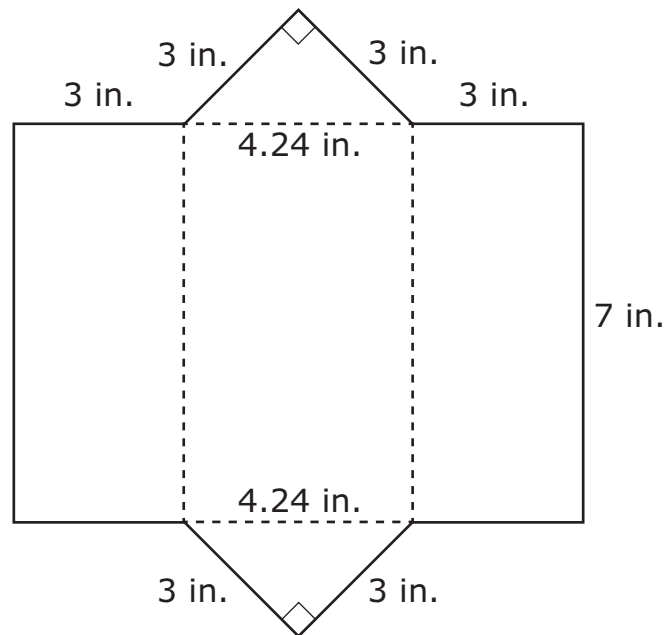
- (A) The number of students who like spaghetti is approximately the same as the number who like hamburgers.
- (B) A small number of students bring their own lunch to school.
- (C) Most students eat salad or pizza every day.
- (D) Almost the whole school prefers pizza.





## 7. Part A

A person wants to make a pencil case in the shape of a triangular prism. He traces the outline using the pattern shown.







- Show or explain the steps needed to calculate the amount of material, in square inches, needed to make 1 pencil case.
- What is the amount of material, in square inches, needed to make 1 pencil case?
- Create an expression that can be used to determine the amount of material, in square inches, to make  $n$  pencil cases.

Enter your explanations, your work, and your answer in the space provided.





### Part B

The material for the pencil case is sold in square-shaped pieces that are 1 foot long. Each piece costs \$5.

- Find the area, **in square inches**, of one piece of material.
- What is the cost per square inch of the material? Show or explain your work.

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

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





# ITEM SET 3 (Calculator)

You may use a calculator for Item Set 3.





1. A turtle travels  $7\frac{7}{8}$  miles in  $\frac{3}{7}$  of a week. At this rate, how many miles per week will the turtle travel?

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

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2. A teacher creates a grading system for a 5-week period.

- There is a weekly quiz worth 18 points.
- There is a weekly homework assignment worth a fixed number of points.
- The total points for all homework assignments during the 5-week period is 170 points.

The equation  $5(x + 18) = 170$  represents this situation.

- Show or explain each step to solve for  $x$ .
- State the value of  $x$ .
- Explain what the solution for  $x$  represents in this situation.

Enter your explanations and your answer in the space provided.





3. A teacher has an equal number of pink, blue, green, yellow, and purple erasers in a box. She will randomly distribute 1 eraser from the box to each student.

What is the probability that the first eraser that will be distributed is a color other than yellow?

- (A)  $\frac{1}{5}$
- (B)  $\frac{1}{4}$
- (C)  $\frac{3}{4}$
- (D)  $\frac{4}{5}$





4. A person is planning an event and wants to order chicken and beans from a store.

- The store charges \$9.49 per pound of chicken and \$5.75 for one quart of beans.
- The person has \$70 to purchase the chicken and the beans.

Let  $p$  represent the number of pounds of chicken.

- Create an equation that can determine the maximum amount of chicken, in pounds, that can be purchased, along with one quart of beans, using the \$70. Do not include tax.
- Solve the equation to determine the maximum amount of chicken that can be purchased. Round your final answer to the nearest quarter pound. Show your work.

Enter your equation, your solution, and your work in the space provided.

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

**Maximum amount of chicken:** \_\_\_\_\_ **pounds**

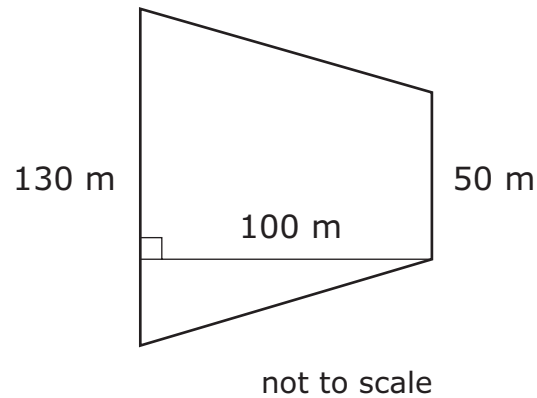
**Your Work:**





## 5. Part A

A piece of land is in the shape of a trapezoid<sup>1</sup>, with parallel sides that are 50 meters and 130 meters long. The distance between the parallel sides is 100 meters, as shown in the diagram.



How large, in square meters, is the piece of land?

Enter your answer in the box.

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| 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 |

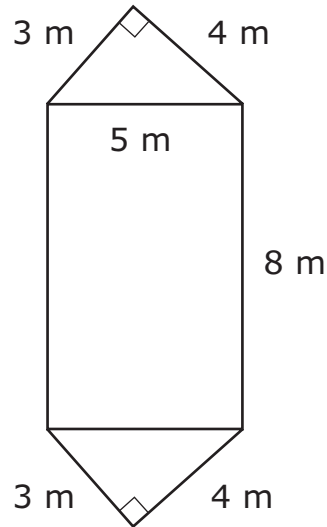
<sup>1</sup>trapezoid—a quadrilateral with at least one pair of parallel sides





### Part B

There is a large picnic area on the property. It is made up of a rectangle, with dimensions of 5 meters by 8 meters, and two right triangles, whose legs are 3 meters and 4 meters long, as shown in the diagram.



How large, in square meters, is the picnic area?

Enter your answer in the box.

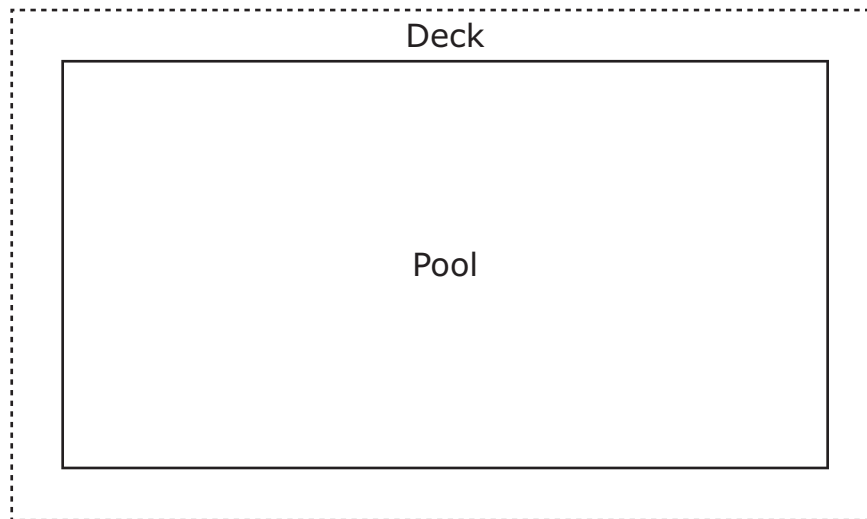
|   |   |   |   |   |   |
|---|---|---|---|---|---|
|   |   |   |   |   |   |
| ⊖ |   |   |   |   |   |
| • | • | • | • | • | • |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 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 6.

A person is building a deck around a rectangular pool, as shown in the diagram.



- The width,  $W$ , of the pool is 8 feet, and the length,  $L$ , of the pool is 15 feet.
- The expression  $2(W + 12) + 2(L + 12)$  can be used to find the total perimeter of the deck, in feet.
- The person uses a different expression,  $2W + 2L + 48$ , to find the perimeter of the deck.

**6. Part A**

How many terms are in the expression  $2W + 2L + 48$ ?

- (A) 2
- (B) 3
- (C) 4
- (D) 5





### **Part B**

- Explain whether the two expressions for finding the perimeter of the deck are equivalent.
- The person claims the perimeter of the deck will be twice the perimeter of the pool. Explain whether the person's claim is correct or incorrect.
- State the perimeter of the pool and the perimeter of the deck.

Enter your explanations and your answers in the space provided.

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



