

# Colorado Measures of Academic Success



# Grade 6 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.

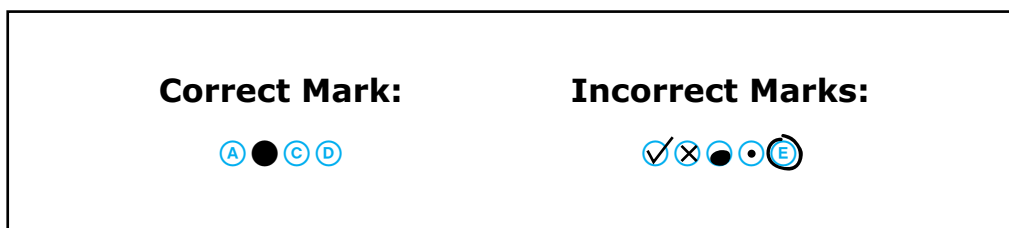
While the use of the sample items is not required, it is strongly encouraged to help ensure students are familiar with the types of items they may encounter while taking the paper-based test.

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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# 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 has the same value as  $54 + 24$ ?

- Ⓐ  $6(9 + 24)$
- Ⓑ  $8(7 + 3)$
- Ⓒ  $6(9 + 4)$
- Ⓓ  $4(50 + 20)$

2. An expression is shown.

$$19 \times 19 \times 19 \times 19 \times 19 \times 19 \times 19$$

Using a base and an exponent, write an expression that is equivalent to the one shown.

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

\_\_\_\_\_



**3.** The point  $(-2, 6)$  is plotted on a coordinate plane.

Which statements are true?

Select the **two** statements that are true.

- A The reflection point across the  $y$ -axis is  $(2, 6)$ .
- B The reflection point across the  $y$ -axis is  $(2, -6)$ .
- C The reflection point across the  $y$ -axis is  $(-2, -6)$ .
- D The reflection point across the  $x$ -axis is  $(2, 6)$ .
- E The reflection point across the  $x$ -axis is  $(2, -6)$ .
- F The reflection point across the  $x$ -axis is  $(-2, -6)$ .

**4.** Which question is a statistical question?

- A Which students in an elementary school class can speak another language?
- B How many students in a middle school class like each type of food?
- C Which elementary classes is the principal visiting this week?
- D How many students are in a middle school?

5. What is the value of this expression?

$$1,224 \div 16$$

- (A) 76.0
- (B) 76.2
- (C) 76.5
- (D) 76.8

6. A baker mixes 42.68 grams of flour and 19.125 grams of sugar in a bowl. The baker then uses 52.76 grams of the mixture in a cake.

How many grams of the mixture does the baker still have?

Enter your answer in the box.

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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

7. Which number is closest to zero on a number line?

(A)  $-\frac{3}{5}$

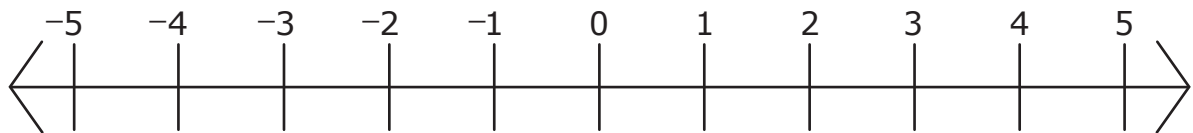
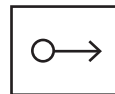
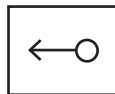
(B)  $-\frac{2}{5}$

(C)  $\frac{1}{5}$

(D)  $\frac{4}{5}$

8. Graph the inequality that shows all the possible values of  $-1 > x$ .

Select the correct ray and then graph the ray beginning at the correct place on the number line.



**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.



Use the information provided to answer Part A and Part B for question 9.

A student makes two statements.

Statement 1:  $2x - 5 + 6 = 2x - 11$  because the sum of 5 and 6 is 11.

Statement 2:  $2x - 5 + 6 = 8x - 5$  because the sum of  $2x$  and 6 is  $8x$ .

**9. Part A**

Evaluate the expressions for  $x = 10$  to show that Statement 1 and Statement 2 are incorrect.

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

$$2x - 5 + 6 = \underline{\hspace{2cm}}$$

$$2x - 11 = \underline{\hspace{2cm}}$$

$$8x - 5 = \underline{\hspace{2cm}}$$



**Part B**

Explain why the student's reasoning in Statement 1 is incorrect.

Explain why the student's reasoning in Statement 2 is incorrect.

Enter your explanation in the space provided.

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





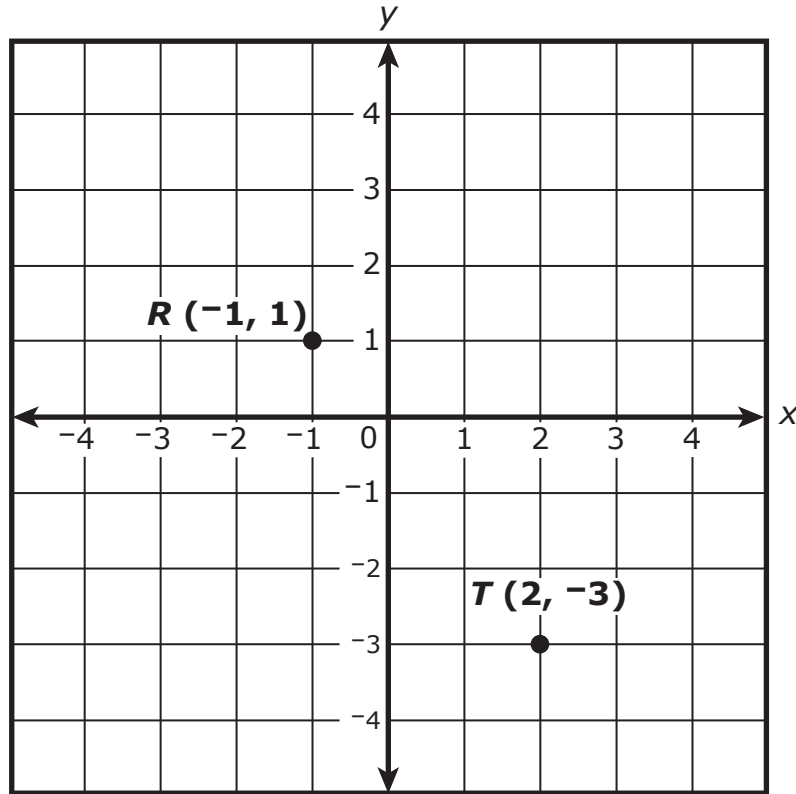


# ITEM SET 2 (Calculator)

You may use a calculator for Item Set 2.



Use the information provided to answer Part A and Part B for question 1.  
Points  $R$  and  $T$  are plotted on a coordinate grid.



**1. Part A**

In right triangle  $RST$ , point  $T$  is graphed at  $(2, -3)$ , and point  $R$  is graphed at  $(-1, 1)$ .

Which coordinate pair describes the location of point  $S$ ?

- Ⓐ  $(-1, -3)$
- Ⓑ  $(-1, 3)$
- Ⓒ  $(1, 2)$
- Ⓓ  $(1, 3)$



**Part B**

Triangle  $MRT$  is graphed with point  $M$  at  $(-4, -3)$ .

What is the length, in units, of side  $\overline{MT}$ ?

- A 3
- B 4
- C 6
- D 7



Use the information provided to answer Part A through Part D for question 2.

The table shows the number of words four students can type in a given amount of time.

### Typing Speeds for Students

Student	Typing Speed
W	225 words in 5 minutes
X	246 words in 6 minutes
Y	266 words in 4 minutes
Z	303 words in 6 minutes

#### 2. Part A

Which student can type the **fewest** number of words in 60 minutes?

- (A) Student W
- (B) Student X
- (C) Student Y
- (D) Student Z

#### Part B

How many words could students X and Y type together in 2 hours?

- (A) 12,900
- (B) 10,750
- (C) 9,675
- (D) 6,450



### Part C

Student Z is typing a document with 5,454 words. How many minutes will it take this student to type this document?

Enter your answer in the box.

⊖					
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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 D

How many more words can Student Y type in 20 minutes compared to Student W?

Enter your answer in the box.

⊖					
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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 3.

Volunteers go to a park to plant trees and build benches. A total of 32 volunteers go to the park. The volunteers are split into groups to do the tasks.

**3. Part A**

There are 26 volunteers planting trees. In 1 hour, 4 volunteers can plant 8 trees. How many trees can the volunteers plant at the park in 3 hours?

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

- |   |   |   |    |    |    |    |    |     |     |
|---|---|---|----|----|----|----|----|-----|-----|
| 1 | 2 | 4 | 16 | 24 | 26 | 48 | 52 | 144 | 156 |
|---|---|---|----|----|----|----|----|-----|-----|

Each volunteer can plant  trees in 1 hour.

The volunteers can plant  trees in 3 hours.



### **Part B**

In 4 hours, 6 volunteers can build 60% of the total benches needed. The volunteers will continue to work at the same rate until all the benches are built.

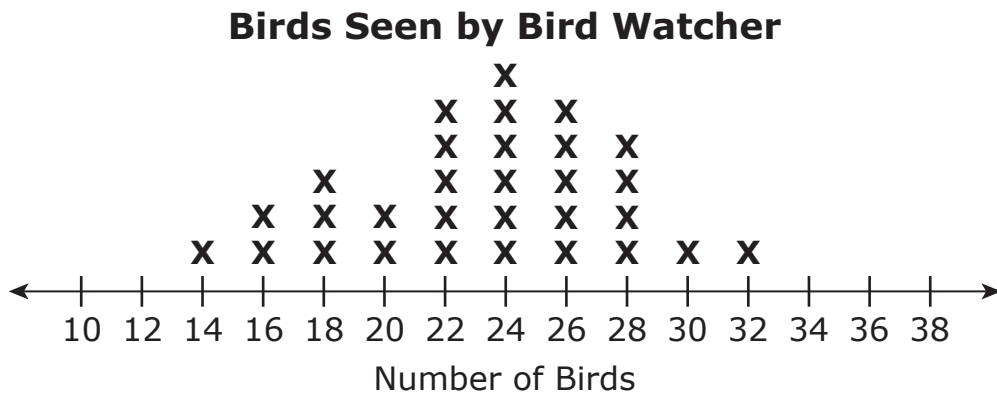
- At this rate, how many more hours will the volunteers need to build the remaining benches?
- Show or explain your steps.

Enter your answer and your steps in the space provided.



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

The number of birds seen by a bird watcher each day for 30 days is recorded in a line plot.



**4. Part A**

What is the mean number of birds seen by the bird watcher each day?

- (A) 18
- (B) 21.81
- (C) 23.27
- (D) 24





### Part B

The bird watcher describes the center of the data set as the mean.

Which statement explains a reason the bird watcher would choose the mean to describe the center of the data set?

- Ⓐ More than half of the recorded number of birds seen by the bird watcher are less than the mean.
- Ⓑ The line plot showing the number of birds seen by the bird watcher is equally distributed.
- Ⓒ There are about the same number of data points above and below the mean.
- Ⓓ The mean is lower than all the data points.



5. A serving of dog food is  $\frac{5}{8}$  cup. There are  $3\frac{3}{4}$  cups of dog food in a bag.

- Write an expression to determine how many servings of dog food are in the bag. Your expression must include fractions.
- Determine the number of servings of dog food in the bag. Show your work.
- Explain how to check your answer for the number of servings of dog food by using an equation with a different operation. Your equation must include fractions.

Enter your expression, your answer, your equation, and your explanations in the space provided.



**TURN THE PAGE AND  
CONTINUE WORKING**



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

An artist is filling jars with sand of different colors and different amounts.

- The artist divides the same amount of blue sand, the same amount of green sand, and the same amount of red sand into each of 20 jars.
- Each jar holds a total of 3.2 ounces of sand.
- The price of the sand is \$0.17 per ounce.

### Sand Needed

Color	Total Amount of Sand (ounces)
Blue	18
Green	24
Red	?



## 6. Part A

- Determine the amount of red sand, in ounces, needed for all 20 jars.
- Write an equation or set of equations that can be used to find  $r$ , the amount of red sand, in ounces, the artist needs for all 20 jars.
- Write an equation or set of equations to find  $p$ , the price of the red sand needed for all 20 jars.

Enter your answer and your equations in the space provided.



### Part B

The artist sells 12 of the 20 jars. The sand from the jars the artist did not sell will be poured into large jars that each hold 10 ounces when full.

- Determine the fewest number of full large jars needed to hold the sand from the jars the artist did not sell.
- Write an equation or set of equations to model  $n$ , the total number of ounces of sand in the jars the artist did not sell.
- Write an equation or set of equations to model  $j$ , the number of large jars needed to hold the sand from the jars the artist did not sell.

Enter your answer and your equations in the space provided.



Use the information provided to answer Part A and Part B for question 7.

A store sells cherries for \$3.70 per pound.

**7. Part A**

A person buys  $x$  pounds of cherries for \$7.56.

Which equation can be used to find the number of pounds of cherries the person buys?

- A  $3.70 + x = 7.56$
- B  $7.56 + x = 3.70$
- C  $3.70x = 7.56$
- D  $7.56x = 3.70$

**Part B**

The store changes the price of the cherries. The equation  $3.70 + p = 4.66$  represents the relationship between the old and new prices of cherries, where  $p$  is the change in the price per pound of cherries.

What is the value of  $p$  in this equation?

- A 0.81
- B 0.90
- C 0.96
- D 1.23



8. What is 45% of 320?

Enter your answer in the box.

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1	1	1	1	1	1
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3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
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7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9



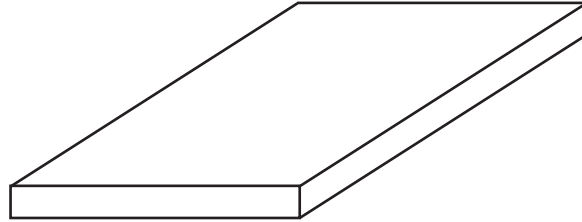


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**9. Part A**

A playground has a sandbox in the shape of a right rectangular prism. The length of the sandbox is  $4\frac{1}{2}$  feet, and the width is  $5\frac{1}{3}$  feet. The height of the sandbox is  $\frac{1}{2}$  foot.



Playground Sandbox

What is the volume, in cubic feet, of the sandbox?

- (A)  $4\frac{11}{12}$
- (B)  $10\frac{1}{3}$
- (C) 12
- (D) 24

**Part B**

Another area of the playground has a soft mat for safety. The area of the rectangular mat is  $9\frac{1}{3}$  square feet. The mat is  $\frac{1}{4}$ -foot thick.

What is the volume, in cubic feet, of the mat?

- (A)  $2\frac{1}{3}$
- (B)  $9\frac{7}{12}$
- (C)  $21\frac{7}{9}$
- (D)  $37\frac{1}{3}$



**10.** Two students are comparing the decimals 13.310, 13.28, and 13.301.

Student A makes an error. He says that  $13.28 > 13.301$  because 8 is greater than 1.

Student B also makes an error. He says that  $13.310 < 13.28$  because 13.310 has a 3 in the tenths place and  $\frac{2}{10}$  is greater than  $\frac{3}{10}$ .

- Explain why the reasoning for Student A is incorrect.
- Explain why the reasoning for Student B is incorrect.
- Explain or show how to order the numbers from least to greatest.
- Find the sum of the three decimals rounded to the nearest tenth.

Enter your explanations and your answer in the space provided.

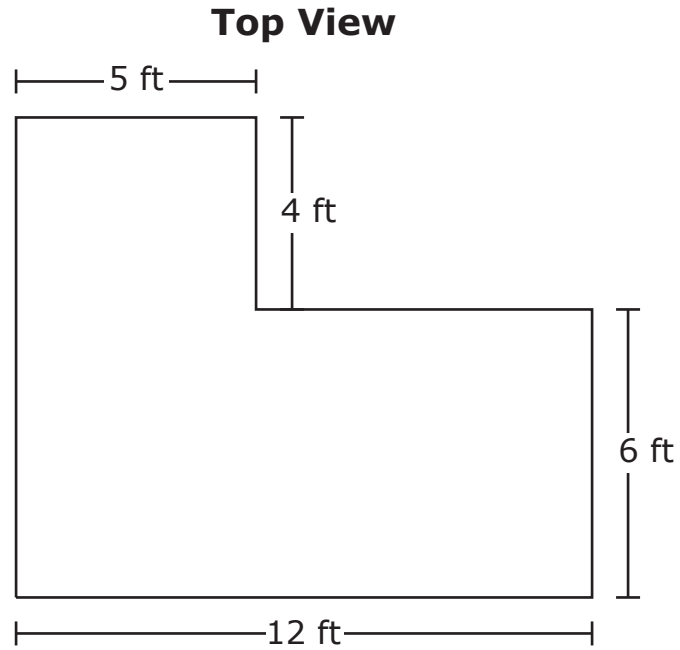


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**11. Part A**

An L-shaped pool is made of two right rectangular prisms. The figure shows a top view of this pool. The pool height is the same for the entire pool.



The pool is filled with water to a height of 4 feet.



- Create an equation or set of equations that can be used to find the volume, in cubic feet, of the pool.
- Explain how you created the equation or set of equations.
- Find the volume, in cubic feet, of the pool.

Enter your equation or set of equations, your explanation, and your answer in the space provided.

**Part B**

A different pool is in the shape of a right rectangular prism and has a volume of 192 cubic feet. The area of the base of the pool is 32 square feet.

- Create an equation to find the height, in feet, of the water in the pool.
- Find the height, in feet, of the water in the pool. Show your work.

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

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

**Height of water:** \_\_\_\_\_ **feet**

**Your Work:**

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





