

PREPARING YOUR CHILD FOR THE  
COLORADO STUDENT  
ASSESSMENT PROGRAM

GRADE 5  
MATHEMATICS

A  
BOOKLET  
FOR  
PARENTS

ADAMS TWELVE Five Star Schools  
11285 Highline Drive  
Northglenn, CO 80233

December 2001

# Introduction

The Colorado Student Assessment Program (CSAP) has been underway since 1997. The purpose of this test is to give parents and teachers information about how well students are achieving the *Colorado Model Content Standards*, better known as the state standards.

Research studies show that parent involvement in their child's education is extremely important in helping students do well in school. One way of being involved is to support your child throughout the school year, as well as, at testing time.

The following pages include information on the Mathematics test in fifth grade. Also included are the CSAP test format, sample test items, and ways in which families can help their children to prepare for the CSAP in mathematics.

We hope the information in this booklet is helpful. We encourage you to communicate often with your child's teachers and principal to continue to support your child's education.

## The Colorado Student Assessment Program (CSAP)

### Purpose for CSAP Testing

The purpose of the Colorado Student Assessment Program (CSAP) is to give information to parents and teachers about how well students are achieving the state standards.

**CSA Administration Schedule  
2001-2002**

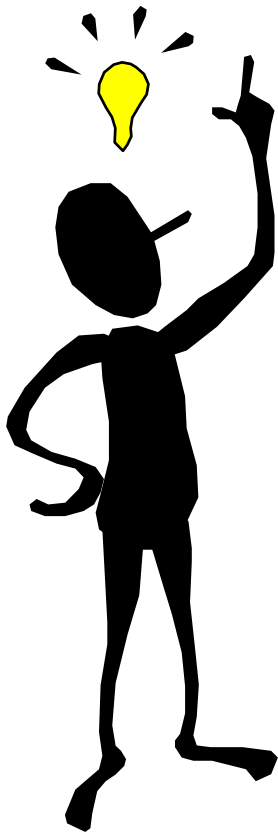
Grade 3	Reading, Writing
Grade 4	Reading, Writing
Grade 5	Reading, Writing, Mathematics
Grade 6	Reading, Writing, Mathematics
Grade 7	Reading, Writing, Mathematics
Grade 8	Reading, Writing, Mathematics, Science
Grade 9	Reading, Writing, Mathematics
Grade 10	Reading, Writing, Mathematics
Grade 11	ACT

**Reporting to Parents**

The results of the student's performance on the CSAP are reported to parents with four performance levels in each subject area:

- Advanced
- Proficient
- Partially Proficient
- Unsatisfactory

# What you can do at home to help prepare your child for the Colorado Student Assessment Program CSAP



Students who are able to *THINK* mathematically generally have more success in the mathematics classroom and on tests. The following are suggestions for working with your child as you travel, shop, cook or wait in line. These ideas are focused on improving your child's ease and fluency to manipulate numbers mentally.

- Discuss and practice doubling numbers out loud.
- Discuss how numbers that are neighbors (  $7 + 8$  ) can use the doubling strategy to find their sum.  
Ex:  $7 + 7 = 14 + 1 \text{ more} = 15$  or  $7 + 8$
- Discuss how easily numbers that are multiples of ten can be added or subtracted.
- Practice adding and subtracting numbers mentally and encouraging your child to find as many different ways as possible to make a number. Ex:  $35 + 15$  is 50. What are three more ways to make 50? ( $75 - 25$ ,  $25 \times 2$ ,  $10 + 40$ )
- Have your child find halves of any number to ten.
- Practice multiplying numbers mentally by 10 and 100.
- Practice halving any number to twenty.
- Practice finding a quarter of any number to ten, then twenty.
- Practice doubling any number from 1 to 100.
- Practice different ways to find the difference in a subtraction problem. Ex:  $14 - 8$  could be  $14 - 10 = 4$  then add 2 back to get 6.  
 $27 - 13$  could be  $27 - 10 = 17$  then subtract 3 more to get 14.
- Play fraction games asking your child whether a fraction is closer to 0,  $\frac{1}{2}$  or 1. Ex: Is  $\frac{1}{3}$  closer to 0,  $\frac{1}{2}$  or 1?
- Talk about percents and ask your child to find percents of \$1.00, \$2.00 etc.

- **Always use the correct math vocabulary and encourage your child to use it when you discuss and play mental math games. Use words like sum, difference, and product.**
- **Have your child point out and name geometric shapes correctly and describe the shape. Ex: four straight sides, 4 right angles, two sets of sides are equal.**
- **Cook with your child and have them halve or double recipes.**
- **Have your child practice counting back change from amounts up to \$10 and \$20.**
- **Play family games that require counting and number operations like Monopoly, cards or dominoes.**
- **Play family games that require strategy skills and memory like Battleship.**
- **Work large, many piece (500 or more) puzzles together. This promotes spatial sense and perseverance.**

## Fifth Grade Mathematics

### Test Construction Information

#### Grade 5

69 items

Total test score points – 96

Multiple choice score points – 54 or 56% of total

Constructed response score points – 42 or 44% of total

Test is designed to be given in three 55-minute sessions (an extra 10 minutes is allowed)

- Each session has a similar composition of items types
- Calculators are not used on the 5<sup>th</sup> grade CSAP Mathematics test

### Weighting of Standards by Grade Level for Mathematics CSAP

	Grade 5	Grade 6	Grade7	Grade 8	Grade 9	Grade10
Standard	% Scorepoints	% Scorepoints	% Scorepoints	% Scorepoints	% Scorepoints	% Scorepoints
1	20	20	30	25	20	20
6	20	15				
2	20	20	20	25	30	30
3	20	20	20	20	25	25
4 and 5	20	25	30	30	25	25

## WHAT SKILLS WILL BE ASSESSED ON THE FIFTH GRADE CSAP MATHEMATICS TEST?

### STANDARD I:

**Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.**

- 1.1a Locate commonly used positive rational numbers\* including terminating decimals through hundredths, fractions, (halves, thirds, fourths, eighths, and tenths), mixed numbers, and percents on a number line.
- 1.1b Using concrete materials, demonstrate the equivalence of commonly-used fractions, terminating decimals, and percents (for example,  $\frac{7}{10} = 0.7 = 70\%$ ).
- 1.1c Demonstrate the meaning of square numbers using pictorial or concrete materials.
- 1.2a Read, write, and order positive rational numbers, including commonly-used fractions and terminating decimals through hundredths.
- 1.2b Compare commonly-used proper fractions and terminating decimals.
- 1.3a Identify factors, multiples, and prime/composite numbers.
- 1.3b Recognize equivalent representations for the same number and generate them by decomposing and composing numbers (for example, 36 can be represented as  $30 + 6$ ,  $20 + 16$ ,  $9 \times 4$ ,  $40 - 4$ , three dozen and/or the square of 6).
- 1.3c Describe numbers by their characteristics (for example, even, odd, prime, square).
- 1.4a Demonstrate the equivalent relationships among commonly used fractions, decimals, and percents using pictorial or concrete materials.
- 1.5a Develop, test, and explain conjectures about properties of whole numbers and commonly-used fractions and decimals.
- 1.5b Use number properties (commutative\*, associative\*, identity\*) to evaluate numeric expressions and solve equations.
- 1.6a Use number sense to estimate sums and differences of fractions and decimals using benchmarks (for example,  $\frac{5}{6} + \frac{7}{8}$  must be equal to an amount less than 2, since each fraction is less than 1).
- 1.6b Use appropriate techniques to estimate, determine, and then justify the reasonableness of solutions to problems involving whole numbers.

**STANDARD 2:**

**Students use algebraic methods to explore, model and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.**

- 2.1a Represent, describe, and analyze geometric and numeric patterns (whole numbers).
- 2.1b Recognize that a variable\* is used to represent an unknown quantity.
- 2.1c Identify such properties as commutatively, associatively, and distributivity and use them to compute with whole numbers.
- 2.2a Solve problems by representing and analyzing patterns using words, tables, and graphs.
- 2.3a Describe how a change in one quantity results in a change in another quantity.
- 2.4a Match a description of a situation with its continuous graph.
- 2.5a Use tables, charts, concrete objects, or pictures to solve problems involving linear relationships with whole numbers.

**STANDARD 3:**

**Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning and processes used in solving these problems.**

- 3.1a Differentiate between categorical\* and numerical\* data.
- 3.1b Organize, construct, and interpret displays of data including tables, charts, pictographs, line plots, bar graphs, and line graphs.
- 3.1c Read, interpret, and draw conclusions from various displays of data.
- 3.1d From a given scenario, choose the correct graph from possible graph representations.
- 3.2a Distinguish between the median and mode of a data set.
- 3.2b Determine the range of a set of data.
- 3.3a Analyze data and draw conclusions based on data displays such as tables, charts, line graphs, bar graphs, pictographs, and line plots.
- 3.4a Describe how data collection methods affect the nature of the data set.
- 3.4b Make convincing arguments based on data analysis.
- 3.5a Describe events such as likely or unlikely and explain the degree of likelihood using words, such as certain, equally likely, and impossible.

3.5b Use zero to represent the probability of an impossible event and one to represent the probability of a certain event.

3.5c Use common fractions to represent the probability of events that are neither certain nor impossible.

3.6a Using one chance device, such as a number cube or a spinner, design a fair game and an unfair game, and explain why they are fair and unfair.

3.6b Make predictions based on data obtained from simple probability experiments.

3.7a Solve problems using strategies for finding all possible combinations\* and/or arrangements.

#### **STANDARD 4:**

**Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.**

4.1a Represent a three-dimensional shape in two dimensions (for example, recognizing a three-dimensional figure from its net).

4.2a Identify, compare, and analyze the attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes (for example, acute, obtuse, right angle, parallel lines, perpendicular lines, intersecting lines, and line segments).

4.2b Make and test conjectures about geometric relationships and develop logical arguments to justify conclusions.

4.4a Given a coordinate graph, read coordinate pairs in quadrant one.

4.4b Choose the coordinate graph, which represents a given data set.

4.4c Use maps and grids to locate points, create paths and measure distances within coordinate system\*.

4.5a Solve problems involving the perimeter of polygons.

4.5b Solve problems involving the area of rectangles and squares.

4.6a Predict and describe the results of flipping, sliding, or turning a two-dimensional shape.

4.6b Show lines of symmetry\* for geometrical shapes.

#### **STANDARD 5:**

**Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning involved in solving these problems.**

5.1a Determine the appropriate unit of measure (metric and US customary) when estimating distance, capacity, and weight.

- 5.1b Estimate the length of common objects.
- 5.1c Estimate the perimeter of polygons.
- 5.1d Estimate the measures of angles (for example,  $90^\circ$  less than  $90^\circ$ , more than  $90^\circ$ ).
- 5.1e Describe angles as acute, obtuse and right.
- 5.3a read and interpret scales on number lines, graphs, and maps.
- 5.3b Select the appropriate scale for a given problem (for example, using the appropriate scale when setting up a graph).
- 5.4a Find the perimeter and areas of rectangles and squares, using appropriate units.
- 5.5a Demonstrate how changing one of the dimensions of a rectangle affects its perimeter (using concrete materials or graph paper).
- 5.5b Demonstrate how changing one of the dimensions of a rectangle affects its area (using concrete materials or graph paper).
- 5.6a Select and use the appropriate unit and tool to measure to the degree of accuracy required in a particular problem.
- 5.6b Measure the sides of rectangles, squares, and triangles to the nearest  $\frac{1}{4}$  inch and nearest centimeter.

#### **STANDARD 6:**

**Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper and pencil, calculators, and computers, in problem-solving situations and communicate the reasoning involved in solving these problems.**

- 6.1a Use concrete materials or pictures, determine commonly-used percentages (for example, 25%, 50%) in problem-solving situations.
- 6.2a Demonstrate the conceptual meaning of the four basic arithmetic operations (addition, subtraction, multiplication, and division).
- 6.2b Use and explain strategies to add, subtract, multiply and divide whole numbers in problem-solving situations.
- 6.2c Demonstrate proficiency of addition, subtraction, multiplication, and division of whole numbers in problem-solving situations.
- 6.2d Use and explain strategies to add and subtract commonly-used fractions with like denominators in problem-solving situations.
- 6.2e use and explain strategies to add and subtract commonly-used decimals in problem-solving situations.
- 6.3a Determine from real-world problems whether an estimated or exact answer is acceptable.
- 6.3b Use and explain a variety of estimation techniques to solve problems/

6.4a Determine whether information given in a problem-solving situation is sufficient, insufficient, or extraneous.

6.4b Given a real-world problem, use an appropriate method (mental arithmetic, estimation, paper and pencil, calculator) to correctly solve the problem.

6.4c Given a math sentence, using any of one of the four operations with whole numbers, create and illustrate a real-world problem.

6.4d In a problem-solving situation, determine whether the results are reasonable and justify those results with correct computations.

## Glossary Supplement

**Associative property** - the operation  $*$  illustrates the associative property:  $x * (y * z) = (x * y) * z$ . Real numbers are associative under the operations of addition,  $x + (y + z) = (x + y) + z$ , and under multiplication,  $x \square (y \square z) = (x \square y) \square z$ .

**Categorical data or variables** - variables that place individuals into groups or categories, such as gender, color, or college major. These are labels that can be used to sort individuals but cannot be used for arithmetical operations.

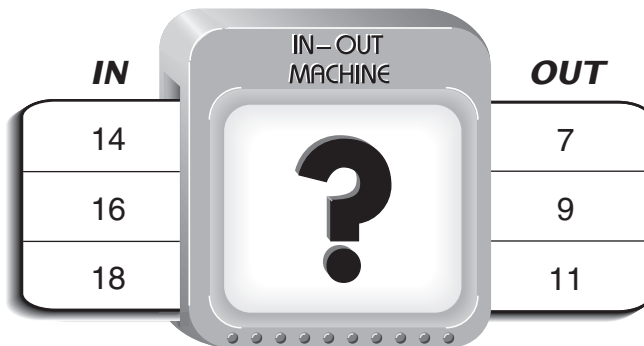
**Commutative property** - the operation  $\square$  illustrates the commutative property:  $x \square y = y \square x$ . Real numbers are commutative under the operations of addition,  $x + y = y + x$ , and under multiplication,  $x \square y = y \square x$ .

**Identity element** - the operation  $\square$  illustrates the identity element as follows:  $x \square 1 = 1 \square x = x$ . In the real number system, 0 is the identity element for addition,  $x + 0 = 0 + x = x$ , and 1 is the identity element for multiplication,  $x \square 1 = 1 \square x = x$ .

**Numerical (quantitative) data or variables** - variables that have numbers associated with them, such as height, weight, or annual income. Arithmetic operations can be performed on the values of these variables.

**\*Note: The definitions for all other words designated with an asterisk (\*) in this document may be found in the glossary of the Colorado Model Content Standards for Mathematics.**

- 3 Study the *In-Out* machine shown below.



What is the rule that changes *In* numbers to *Out* numbers?

- Divide the *In* number by 2.
- Add 7 to the *In* number.
- Subtract 7 from the *In* number.
- Subtract 6 from the *In* number.

- 6** Carmen put 6 buttons into each bowl.



Choose the number sentence that can be used to find the total number of buttons.

- $6 + 7 = \square$
- $7 \times 6 = \square$
- $6 + 6 + 6 + 6 + 6 + 6 = \square$
- $7 + 7 + 7 + 7 + 7 + 7 + 7 = \square$

# CSAP Grade 5

## Mathematics

- 9 Members of a 5th-grade class voted on their favorite outdoor activities. The results of the vote are shown in the table below. Study the table.

FAVORITE OUTDOOR ACTIVITY

Activity	Number of Votes
Baseball	
Bike riding	
Basketball	
Soccer	

### Part A

Use the grid on page 2 to make a **bar graph** that shows the results of the vote.

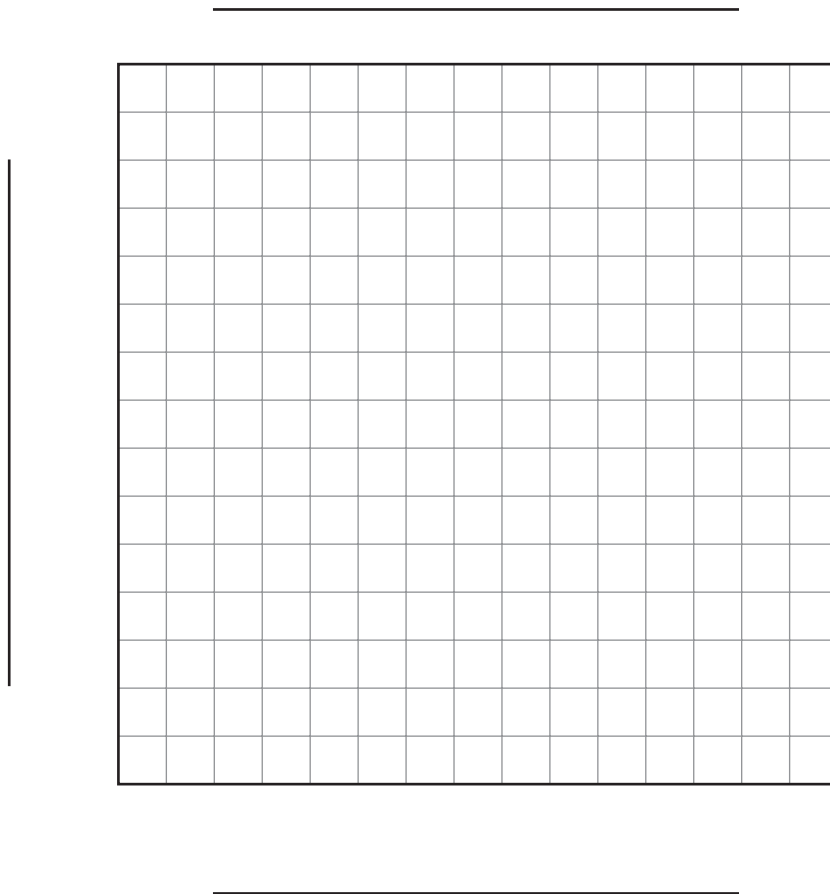
Be sure to

- title your bar graph
- label each axis
- use an appropriate scale

Use grid on page 12

grid—pattern of lines that form squares

*Part A, continued*



*Part B*

On the lines below, write a question that can be answered from the information in your graph.

---

---

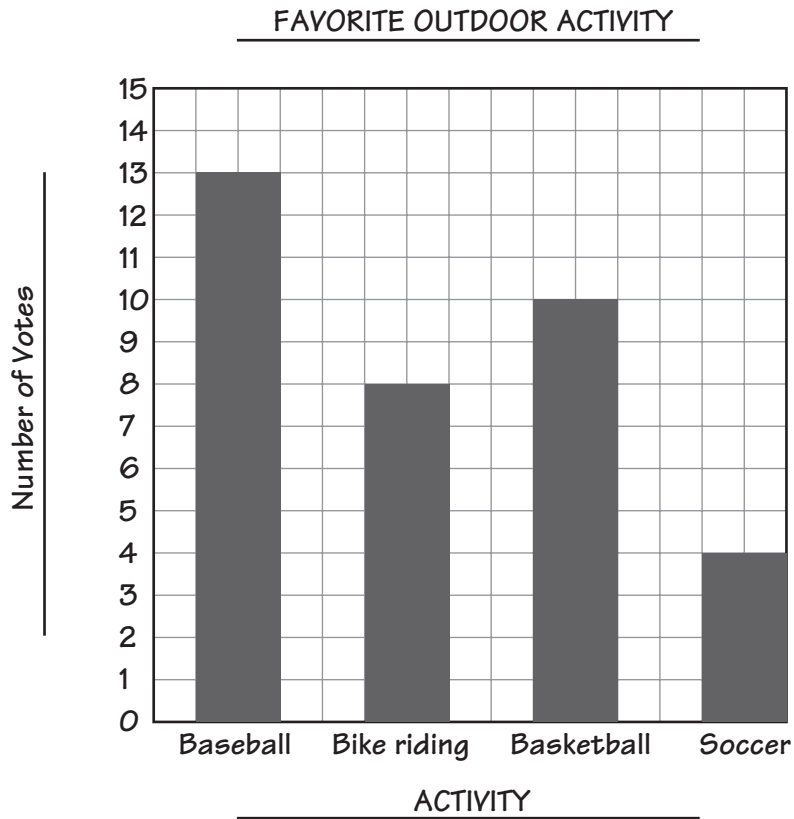
**Rubric**

**Exemplary Response:**

4 Points

**Part A**

- 



AND

**Part B**

- Student writes a question that can be answered only with information from the graph.

**Score Points:**

Apply 4-point holistic rubric.

Standard: 3.1.B Data Analysis, Probability, and Statistics

---

## 2 - Point Rubric for Short Constructed-Response Items

This rubric is used to score students' responses to short constructed-response items. These items require the students to use problem-solving skills as they apply to all of the Colorado Model Content Standards for mathematics. An item may ask the student to include and communicate reasoning using words and /or numbers, evaluate an answer, or demonstrate the process used to determine an answer. There are several short constructed-response items in CSAP, each taking approximately 3 to 5 minutes to complete. Each short constructed-response item receives a single score of 0,1,or 2 points.

### 2 Points

The response accomplishes the prompted purpose and effectively communicates the student's mathematical understanding. The student's strategy and execution meet the content (including concepts, technique, representations, and connections), thinking processes, and qualitative demands of the task. Minor omissions may exist, but do not detract from the correctness of the response.

### 1 Point

The response partially accomplishes the prompted purpose. The student's strategy and execution lack adequate evidence of the learning and strategic tools that are needed to accomplish the task. The response may show some effort to accomplish the task, but with little success. It is clear that the student requires additional feedback and/or instruction from the teacher in order to accomplish the task.

### 0 Points

The response lacks evidence of mathematical knowledge that is appropriate to the intent of the task.

---

---

## **3 - Point Rubric for Medium Constructed-Response Items**

This rubric is used to score students' responses to medium constructed-response items. These items require the student to use problem-solving skills that may require the construction of a graph or a model, the extension of a pattern, or the use of geometric relationships and spatial reasoning. These items may also include an explanation of reasoning, evaluation of methods, or application to real-world situations. There are several medium constructed-response items in CSAP, each taking approximately 10 minutes to complete. Each extended constructed-response item receives a single score of 0, 1, 2, or 3 points.

### **3 Points**

The response accomplishes the prompted purpose and effectively communicates the student's mathematical understanding. The student's strategy and execution meet the content (including concepts, technique, representations, and connections), thinking processes and qualitative demands of the task. Minor omissions may exist, but do not detract from the correctness of the response.

### **2 Points**

The response demonstrates adequate evidence of the learning and strategic tools necessary to complete the prompted purpose. It may contain overlooked issues, misleading assumptions, and/or errors in execution. Evidence in the response demonstrates that the student can revise the work to accomplish the task with the help of written feedback or dialogue.

### **1 Point**

The response demonstrates some evidence of mathematical knowledge that is appropriate to the intent of the prompted purpose. An effort was made to accomplish the task, but with little success. Evidence in the response demonstrates that with instruction the student can revise the work to accomplish the task.

### **0 Points**

The response lacks any evidence of mathematical knowledge that is appropriate to the intent of the task.

---

---

## 4 - Point Rubric for Extended Constructed-Response Items

This rubric is used to score students' responses to extended constructed-response items. These items require the student to use problem-solving skills that may require the construction of a graph or a model, the extension of a pattern, or the use of geometric relationships and spatial reasoning. These items may also include an explanation of reasoning, evaluation of methods, or application to real-world situations.

There are several extended constructed-response items in CSAP, each taking approximately 15 minutes to complete. Each extended constructed-response item receives a single score of 0, 1, 2, 3 or 4 points.

### 4 Points

The response accomplishes the prompted purpose and effectively communicates the student's mathematical understanding. The student's strategy and execution meet the content (including concepts, technique, representations, and connections), thinking processes and qualitative demands of the task. Minor omissions may exist, but do not detract from the correctness of the response.

### 3 Points

The response provides adequate evidence of the learning and strategic tools necessary to complete the prompted purpose. It may contain overlooked issues, misleading assumptions, and/or errors in execution. Evidence in the response demonstrates that the student can revise the work to accomplish the task with the help of written feedback. The student does not need a dialogue or additional instructions.

### 2 Points

The response partially completes the task, but lacks adequate evidence of the learning and strategic tools that are needed to accomplish the prompted purpose. It is not clear that the student is ready to revise the work without more instruction.

### 1 Point

The response demonstrates some evidence of mathematical knowledge that is appropriate to the intent of the prompted purpose. An effort was made to accomplish the task, but with little success. Minimal evidence in the response demonstrates that with instruction the student can revise the work to accomplish the task.

### 0 Points

The response lacks any evidence of mathematical knowledge that is appropriate to the intent of the task.

---