

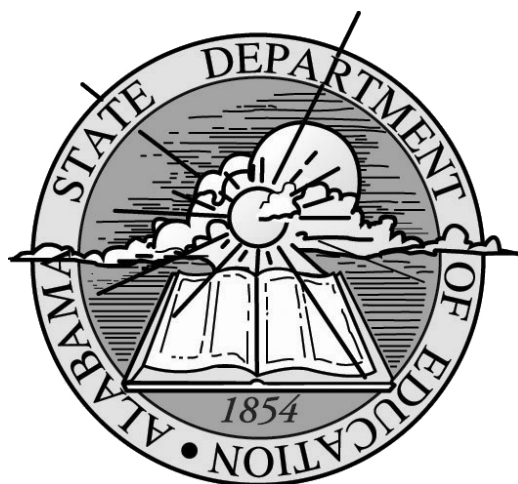
Alabama Reading and Mathematics Test⁺

Item Specifications

for

Mathematics

Grade 5



**Alabama State Department of Education
Montgomery, Alabama
December 2011**

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INTRODUCTION

This document provides specific information about the *Alabama Reading and Mathematics Test⁺* (ARMT⁺). Educators representing each State Board of Education district as well as both city and county school systems served on committees to determine the content standards on which the ARMT⁺ is based. In addition, educators from throughout the state of Alabama served on committees to review the content of the tests, including selecting and reviewing specific mathematics test items, and determining achievement levels.

Teachers must be familiar with the information in this document so that they may incorporate effective teaching of the mathematics content standards with classroom assessments. Using classroom assessments with similar test formats from time to time will help to enable students to demonstrate proficiency on the various content standards in mathematics.

Three item types are included in the ARMT⁺. Multiple-choice, gridded, and open-ended items assess student performance on the ARMT⁺ in mathematics. Multiple-choice items and gridded items carry a point value of 1, while open-ended items carry a point value of 3. In this document, teachers will see representative item types for each mathematics content standard.

Content Standard	A statement of what students should know and be able to do by the end of the academic year
Item Type	Multiple-choice, gridded, open-ended items
Additional Information	Further information about the test items for the content standard
Sample Items	A collection of item types for each content standard
Answer Key	Answers for multiple-choice items and gridded items
Scoring Rubrics for Open-Ended Items	Scoring guide for open-ended items

CONTENT STANDARDS

Grade 5

CONTENT STANDARD	POINTS POSSIBLE
Number and Operations 1- Demonstrate number sense by comparing, ordering, rounding, and expanding whole numbers through millions and decimals to thousandths. 2- Solve problems involving basic operations on whole numbers, including addition and subtraction of seven-digit numbers, multiplication with two-digit multipliers, and division with two-digit divisors. 3- Solve word problems that involve decimals, fractions, or money. 4- Determine the sum and difference of fractions with common and uncommon denominators. 5- Identify numbers less than zero by extending the number line.	4 6 9 6 <u>3</u> 28
Algebra 6- Demonstrate the commutative, associative, and identity properties of addition and multiplication of whole numbers. 7- Write a number sentence for a problem expressed in words.	4 <u>4</u> 8
Geometry 8- Identify regular polygons and congruent polygons. 9- Identify components of the Cartesian plane, including the x -axis, y -axis, origin, and quadrants. 10- Identify the center, radius, and diameter of a circle.	3 3 <u>2</u> 8
Measurement 11- Estimate perimeter and area of irregular shapes using unit squares and grid paper. 12- Calculate the perimeter of rectangles from measured dimensions. 13- Convert a larger unit of measurement to a smaller unit of measurement within the same system, customary or metric.	3 3 <u>4</u> 10
Data Analysis and Probability 14- Analyze data collected from a survey or experiment to distinguish between what the data show and what might account for the results. 15- Use common fractions to represent the probability of events that are neither certain nor impossible.	5 <u>4</u> 9
TOTAL POINTS POSSIBLE	63

ITEMS BY CONTENT STANDARD

DIRECTIONS (These are the directions read by students and the test administrator for Part 1.)

Read the problem and find the answer.

Calculators may *not* be used for Part 1 of the test.

If the problem has a multiple-choice answer, darken the bubble in the correct space in your answer document.

If the problem has an answer grid:

- Write your answer in the boxes at the top of the grid.
- Darken the correct bubble of the number or symbol in the column below.

If your answer is a repeating decimal, round to the nearer hundredth.

For the problems that ask you to show your work, use the space given in your answer document.

- Be sure to show all of your work or explain how you got your answer in the space given.

For all problems, be sure to check your answers.

ITEMS BY CONTENT STANDARD

There are no written directions for Part 2. The directions will be given orally by the test administrator.

DIRECTIONS (These are the directions read by students and the test administrator for Part 3.)

Read the problem and find the answer.

Calculators may be used for Part 3 of the test.

If the problem has a multiple-choice answer, darken the bubble in the correct space in your answer document.

If the problem has an answer grid:

- Write your answer in the boxes at the top of the grid.
- Darken the correct bubble of the number or symbol in the column below.

If your answer is a repeating decimal, round to the nearer hundredth.

For the problems that ask you to show your work, use the space given in your answer document.

- Be sure to show all of your work or explain how you got your answer in the space given.
- If you use your calculator to get your answer, explain the steps you take.

For all problems, be sure to check your answers.

NUMBER AND OPERATIONS**Content Standard 1**

Demonstrate number sense by comparing, ordering, rounding, and expanding whole numbers through millions and decimals to thousandths.

Item Type

Multiple-choice

Additional Information

Word problems/real-life situations may be used.

Tables and charts may be used.

In comparing numbers, *greater than*, *greatest*, *less than*, or *least* may be used (**symbols** or words).

In ordering numbers, *greatest to least* or *least to greatest* may be used.

In rounding numbers, *closest* or *nearer* may be used.

Sample Multiple-Choice Items

1. Which of the following shows 9,678,345 in expanded form?

- A** $9,000,000 + 700,000 + 8,000 + 300 + 40 + 5$
- B** $9,000,000 + 600,000 + 70,000 + 8,000 + 300 + 40$
- C** $9,000,000 + 600,000 + 70,000 + 8,000 + 300 + 40 + 5 *$
- D** $96,000,000 + 700,000 + 80,000 + 300 + 40 + 5$

2. In 2008, the winner of a 100-meter swim finished in 50.58 seconds.

Which shows this time written in expanded form?

- A** $5 + 0 + 5 + 8$
- B** $5 + 0.5 + 0.08$
- C** $50 + 50 + 8$
- D** $50 + 0.5 + 0.08$ *

5. Which number below has the *greatest* value?

0.108 0.118 0.109 0.110

- A** **B** * **C** **D**

3. In 2000, the population of Mobile, Alabama, was 198,915 people.

What is 198,915 rounded to the *nearer* thousand?

- A** 198,000
- B** 198,900
- C** 199,000 *
- D** 200,000

6. Which number is *greater* than 255.037?

- A** 254.051
- B** 255.008
- C** 254.099
- D** 255.043 *

4. Which statement below is true?

- A** $200,883 < 200,873$
- B** $551,321 < 516,323$
- C** $775,843 > 775,795$ *
- D** $878,999 > 888,373$

7. Which statement below is true?

- A** $0.065 < 0.160$ *
- B** $0.099 > 0.102$
- C** $0.125 > 0.199$
- D** $0.131 < 0.125$

8. The water temperatures ($^{\circ}\text{F}$) of four different locations in the Gulf of Mexico are shown below.

59.2; 55.9; 56.5; 51.8

Which shows the temperatures in order from *least* to *greatest*?

- A** 59.2; 55.9; 56.5; 51.8
- B** 51.8; 56.5; 55.9; 59.2
- C** 59.2; 56.5; 51.8; 55.9
- D** 51.8; 55.9; 56.5; 59.2 *

9. The scores of a gymnastics all-around are shown in the table below.

**Gymnastics
All-Around Scores**

Name	Score
Arin	28.3
Michael	27.245
Jarrell	27.25
Tomoki	28.09

What is the *greatest* all-around score?

- A** 28.3 *
- B** 27.245
- C** 27.25
- D** 28.09

10. About 12,000 people attended a ball game last weekend.

Which number is *closest* to 12,000?

- A** 12,050
- B** 11,964 *
- C** 12,935
- D** 11,500

Answer Key

Content Standard 1

Sample Multiple-Choice

1. C
2. D
3. C
4. C
5. B
6. D
7. A
8. D
9. A
10. B

NUMBER AND OPERATIONS**Content Standard 2**

Solve problems involving basic operations on whole numbers, including addition and subtraction of seven-digit numbers, multiplication with two-digit multipliers, and division with two-digit divisors.

Item Type

Multiple-choice

Gridded

Open-ended

Additional Information

Word problems/real-life situations may be used.

Tables and chart may be used.

Fractions will not be used.

Multiple steps may be used.

Money values may be used.

Remainders may be used.

Sample Multiple-Choice Items

1. In one year a music group sold 41,115 CDs, and the next year they sold 29,066 CDs.

How many CDs did the music group sell altogether?

- A** 60,171
- B** 61,181
- C** 70,181 *
- D** 80,181

2. In the magazine aisle at the grocery store there are 17 rows of magazines. In each row there are 13 magazines. How many magazines are in the aisle?

- A** 30
- B** 121
- C** 221 *
- D** 421

Sample Gridded Items

1. Dana sold 29 purses for a total of \$928, including tax. Each purse was sold for an equal amount.

What was the cost of each purse?

Mark your answer in the answer grid.

4. The school auditorium has 48 rows. There are 25 seats in each row.

What is the total number of seats in the school auditorium?

Mark your answer in the answer grid.

2. A factory has 1,440 items to put into boxes. Each box will hold 24 items.

What is the *least* number of boxes the factory will need?

Mark your answer in the answer grid.

5. Jackie bought a 192-ounce container full of water. She wants to use the water to fill bottles. Each bottle holds 12 ounces.

What is the *greatest* number of 12-ounce bottles Jackie could fill with the water from the 192-ounce container?

Mark your answer in the answer grid.

3. There are 11 cattle ranchers that sold a total of 7,832 cattle. Each cattle rancher sold an equal number of cattle.

What was the number of cattle sold by each cattle rancher?

Mark your answer in the answer grid.

Sample Open-Ended Items

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

1. Mr. Lee is making bracelets to sell.
 - a. He made 26 bracelets each week for 3 weeks. How many bracelets did Mr. Lee make in 3 weeks?
 - b. It took Mr. Lee 12 minutes to make a bracelet. How many minutes did it take him to make all of the bracelets in **part a**?
 - c. Mr. Lee used 13,416 beads for all of the bracelets in **part a**. He put the same number of beads on each bracelet. How many beads did he put on each bracelet?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

2. A box has 64 crayons.
- a. An art teacher has 36 boxes of crayons. How many crayons are in 36 boxes?
 - b. Another art teacher has 512 crayons. The teacher will put the same number of crayons into 32 containers. All of the crayons will be put into containers. What is the number of crayons the teacher will put into each container?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

3. The table below shows the populations of Town A for 4 different years.

Town A Population

Year	Population
1	78,152
2	80,234
3	81,996
4	82,947

- How much greater was the population of Town A in year 2 than in year 1?
- Town A is divided into 12 different neighborhoods. In year 3 each neighborhood had the same number of people. How many people lived in each neighborhood in year 3?
- The population of Town A increased by 3,489 from year 4 to year 5. What was the population of Town A in year 5?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

Answer Key

Content Standard 2

Sample Multiple-Choice

1. C
2. C

Sample Gridded

1. \$32
2. 60
3. 712
4. 1200
5. 16

Sample Open-Ended

1. Sample Response(s): a. $26 \times 3 = 78$ OR $26 + 26 + 26 = 78$ OR Equivalent b. $78 \times 12 = 936$ OR Equivalent c. $13,416 \div 78 = 172$ OR Equivalent	
Score Point	Response Attributes
3	All is correct.
2	All logics are correct. <div style="text-align: center;">OR</div> Two correct logics and correct answers for one or more problems. <div style="text-align: center;">OR</div> One correct logic and all three answers are correct.
1	One or more answers to problems are correct without logic. <div style="text-align: center;">OR</div> One logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

2. Sample Response(s):

a. $64 \times 36 = 2,304$

OR

Equivalent

b. $512 \div 32 = 16$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Two logics are correct. OR One logic and one or more answers are correct.
1	One or more answers to problems are correct without logic. OR One logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

NUMBER AND OPERATIONS**Content Standard 3**

Solve word problems that involve decimals, fractions, or money.

Item Type

Multiple-choice

Open-ended

Additional Information

Word problems/real-life situations may be used.

Tables and charts may be used.

Multiple steps may be used.

Fractions may or may not need to be in their simplest form.

Sample Multiple-Choice Items

1. Ms. Buie took her son and daughter to buy school supplies. Her son's supplies cost \$23.94 and her daughter's supplies cost \$19.07.

If tax is included in the totals, how much did Ms. Buie spend on the school supplies?

- A** \$43.01 *
- B** \$42.10
- C** \$33.11
- D** \$32.91

2. Melinda has $6\frac{3}{4}$ cups of sugar in her sugar canister. She used all but $2\frac{1}{4}$ cups of sugar from the canister to make cookies.

How many cups of sugar did Melinda use to make the cookies?

- A** 9
- B** $8\frac{1}{2}$
- C** $4\frac{1}{2}$ *
- D** $4\frac{1}{4}$

3. Fiona used $\frac{2}{3}$ cup of granola and $\frac{1}{4}$ cup of oatmeal to make breakfast bars.

How many cups of granola and oatmeal combined did Fiona use?

$$\frac{2}{12}$$

A

$$\frac{5}{12}$$

B

$$\frac{3}{7}$$

C

$$\frac{11}{12}$$

D *

5. Jay's total bill at the shoe store was \$46.19. He gave the clerk \$50.00.

How much change should Jay get back from the clerk?

A \$ 3.19**B** \$ 3.81 ***C** \$ 6.11**D** \$16.19

4. A farmer has 150 pounds of apples. The apples will be put into bags.

How many bags can be filled if 2.5 pounds of apples are put into each bag?

6

A

60

B *

75

C

375

D

Sample Open-Ended Items

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

1. Each morning for breakfast, Sam has eggs, cheese, and milk.
 - a. Each egg provides Sam with $\frac{1}{10}$ of his daily protein. How many eggs should Sam eat to get $\frac{1}{5}$ of his daily protein?
 - b. Each cup of milk provides Sam with $\frac{1}{5}$ of his daily protein. What fraction of his daily protein does Sam get by drinking 1 cup of milk and eating 1 egg?
 - c. Each piece of cheese provides Sam with $\frac{1}{10}$ of his daily protein. Using at least 1 egg, 1 cup of milk, and 1 piece of cheese, write one *possible* way that Sam could receive $\frac{7}{10}$ of his daily protein.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

2. Tayla's favorite music Web site charges \$9.99 for a full album and \$1.29 for individual songs.
 - a. Tayla wants to buy 6 individual songs. How much money will she spend on those 6 songs?
 - b. Tayla is going to buy a full album. The full album has 12 songs on it. What will be the price of each song, rounded to the *nearer* cent, on that album?
 - c. How much less does Tayla spend when she buys a full album of 12 songs than when she buys 12 individual songs?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

3. The table below shows the weights, in grams, of different U.S. coins.

U.S. Coin Weights

Coin	Weight (grams)
Penny	2.5
Quarter	5.67

- What is the weight, in grams, of 12 quarters?
- A pile of pennies weighs 92.5 grams. How many pennies are in the pile?
- What is the weight, in grams, of a combination of pennies and quarters that equals 78¢?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

Answer Key

Content Standard 3

Sample Multiple-Choice

1. A
2. C
3. D
4. B
5. B

Sample Open-Ended**1. Sample Response(s):**

a. $1/5 \div 1/10 = 2$

OR

Equivalent

b. $1/5 + 1/10 = 2/10 + 1/10 = 3/10$

OR

Equivalent

c. 2 eggs, 2 cups of milk, 1 piece of cheese because $2/10 + 4/10 + 1/10 = 7/10$

OR

4 eggs, 1 cup of milk, 1 piece of cheese because $4/10 + 2/10 + 1/10 = 7/10$

OR

1 egg, 1 cup of milk, 4 pieces of cheese because $1/10 + 2/10 + 4/10 = 7/10$

OR

3 eggs, 1 cup of milk, 2 pieces of cheese because $3/10 + 2/10 + 2/10 = 7/10$

OR

2 eggs, 1 cup of milk, 3 pieces of cheese because $2/10 + 2/10 + 3/10 = 7/10$

OR

1 egg, 2 cups of milk, 2 pieces of cheese because $1/10 + 4/10 + 2/10 = 7/10$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	All logics are correct. OR Two correct logics and correct answers for one or more problems. OR One correct logic and correct answers for all three problems.
1	One or more answers to problems are correct without logic. OR One logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

2. Sample Response(s):

a. $\$1.29 \times 6 = \7.74

OR

Equivalent

b. $\$9.99 \div 12 = \0.8325 ; $\$0.83$ or 83¢

OR

Equivalent

c. $12 \times \$1.29 = \15.48 ; $\$15.48 - 9.99 = \5.49

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	<p>All logics are correct.</p> <p style="text-align: center;">OR</p> <p>Two correct logics and correct answers for one or more problems.</p> <p style="text-align: center;">OR</p> <p>One correct logic and correct answers for all three problems.</p>
1	<p>One or more answers to problems are correct without logic.</p> <p style="text-align: center;">OR</p> <p>One logic is correct.</p>
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

3. Sample Response(s):

a. $12 \times 5.67 = 68.04$ grams

OR

Equivalent

b. $92.5 \div 2.5 = 37$ (pennies)

OR

Equivalent

c. $3 \text{ quarters} + 3 \text{ pennies} = 3 \times 5.67 + 3 \times 2.5 = 17.01 + 7.5 = 24.51$ grams

OR

$2 \text{ quarters} + 28 \text{ pennies} = 2 \times 5.67 + 28 \times 2.5 = 11.34 + 70 = 81.34$ grams

OR

$1 \text{ quarter} + 53 \text{ pennies} = 5.67 + 53 \times 2.5 = 5.67 + 132.5 = 138.17$ grams

OR

$0 \text{ quarters} + 78 \text{ pennies} = 0 \times 5.67 + 78 \times 2.5 = 195$ grams

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	<p>All logics are correct.</p> <p align="center">OR</p> <p>Two correct logics and correct answers for one or more problems.</p> <p align="center">OR</p> <p>One correct logic and correct answers for all three problems.</p>
1	<p>One or more answers to problems are correct without logic.</p> <p align="center">OR</p> <p>One logic is correct.</p>
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

NUMBER AND OPERATIONS

Content Standard 4

Determine the sum and difference of fractions with common and uncommon denominators.

Item Type

Multiple-choice
Gridded

Additional Information

No word problems/real-life situations will be used.
Bare computational problems will be used.
Mixed numbers may be used.
Reducing fractions may be required.

Sample Multiple-Choice Items

1. $2\frac{1}{8} + 12\frac{7}{8} = \square$

14

A $14\frac{8}{16}$ **B**

15

C * $15\frac{1}{8}$ **D**

2. $\frac{5}{8} - \frac{1}{3} = \square$

 $\frac{4}{24}$ **A** $\frac{7}{24}$ **B *** $\frac{4}{5}$ **C** $\frac{23}{24}$ **D**

3. $16\frac{2}{7} - 7\frac{2}{7} = \square$

10

A $9\frac{4}{7}$ **B** $9\frac{2}{7}$ **C**

9

D *

5. $3\frac{5}{8} - 2\frac{1}{2} = \square$

 $1\frac{1}{8}$ **A *** $1\frac{4}{6}$ **B** $1\frac{4}{8}$ **C** $1\frac{1}{4}$ **D**

4. $6\frac{2}{7} + 1\frac{3}{7} = \square$

 $7\frac{5}{7}$ **A *** $7\frac{6}{7}$ **B** $7\frac{5}{14}$ **C** $7\frac{6}{14}$ **D**

6. $\frac{1}{5} + \frac{1}{2} = \square$

 $\frac{2}{10}$ **A** $\frac{2}{7}$ **B** $\frac{1}{3}$ **C** $\frac{7}{10}$ **D ***

Sample Gridded Items

1. $\frac{5}{6} - \frac{1}{3} = \square$

Mark your answer in the answer grid.

4. $\frac{5}{8} - \frac{3}{10} = \square$

Mark your answer in the answer grid.

2. $\frac{9}{10} + \frac{1}{4} = \square$

Mark your answer in the answer grid.

5. $1\frac{3}{10} - \frac{3}{4} = \square$

Mark your answer in the answer grid.

3. $\frac{2}{9} + \frac{2}{6} = \square$

Mark your answer in the answer grid.

6. $\frac{9}{10} - \frac{17}{20} = \square$

Mark your answer in the answer grid.

Answer Key

Content Standard 4

Sample Multiple-Choice

1. C
2. B
3. D
4. A
5. A
6. D

Sample Gridded

1. $\frac{3}{6}$ or $\frac{1}{2}$ or 0.5
2. $\frac{23}{20}$ or $1\frac{3}{20}$ or 1.15
3. $\frac{30}{54}$ or $\frac{15}{27}$ or $\frac{10}{18}$ or $\frac{5}{9}$ or 0.56
4. $\frac{13}{40}$ or 0.325
5. $\frac{22}{40}$ or $\frac{11}{20}$ or 0.55
6. $\frac{1}{20}$ or 0.05

NUMBER AND OPERATIONS**Content Standard 5**

Identify numbers less than zero by extending the number line.

Item Type

Multiple-choice

Additional Information

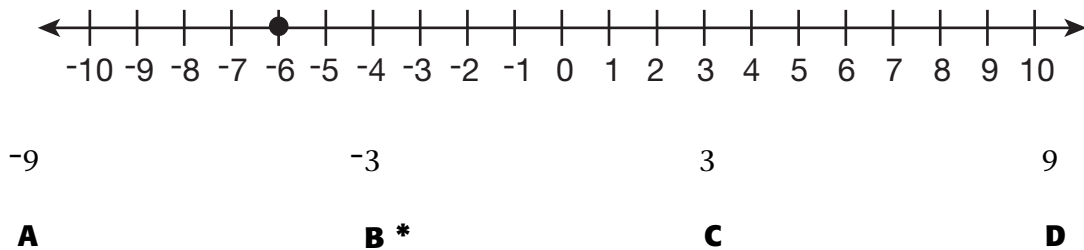
Word problems/real-life situations may be used.

A number line may be used.

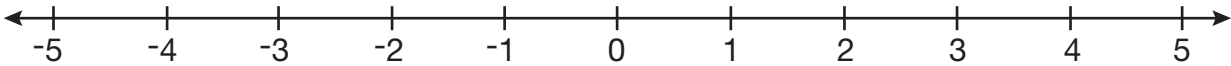
A thermometer may be used.

Sample Multiple-Choice Items

1. What number is 3 spaces to the right of -6 on the number line below?

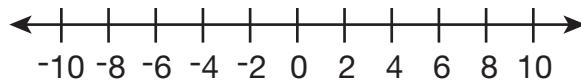


2. What number is 5 spaces to the left of 3 on the number line below?



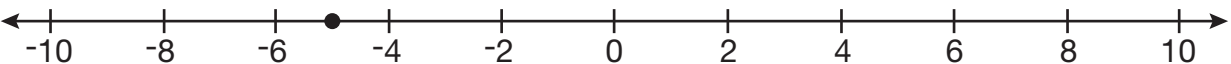
- 8 2 -2 -7
- A** **B** **C *** **D**

3. How many units apart are 4 and -2 on the number line below?



- 2 3 4 6
- A** **B** **C** **D ***

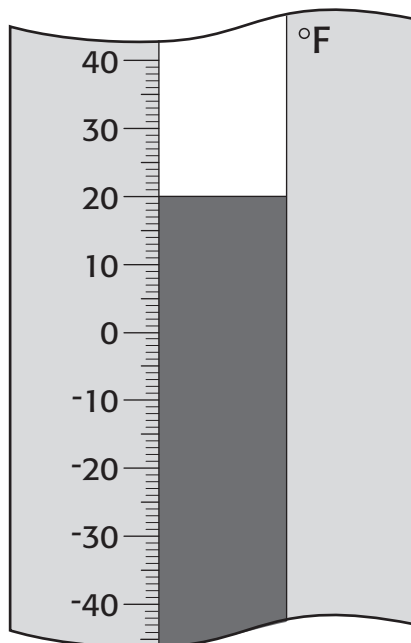
Neveah started at the point marked on the number line below and moved right 6 units.



4. Between which 2 numbers did Neveah end?

- A** Between -10 and -12 **C** Between 2 and 4
- B** Between 0 and 2 ***** **D** Between 6 and 8

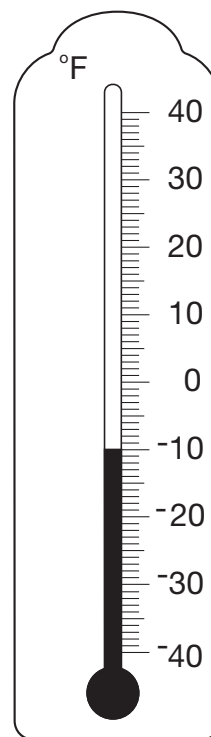
Look at the thermometer below.



5. What will be the temperature, in degrees Fahrenheit, if it drops 30 degrees?

-30° -10° 30° 50°
A **B *** **C** **D**

The temperature dropped 4 degrees to the temperature shown on the thermometer below.



6. What was the temperature before it dropped?

-14° -6° 4° 6°
A **B *** **C** **D**

Answer Key

Content Standard 5

Sample Multiple-Choice

1. B
2. C
3. D
4. B
5. B
6. B

ALGEBRA

Content Standard 6

Demonstrate the commutative, associative, and identity properties of addition and multiplication of whole numbers.

Item Type

Multiple-choice

Additional Information

No word problems/real-life situations will be used.

Multiple steps may be required.

Parentheses may be used.

Sample Multiple-Choice Items

1. Which expression should go in the box to make the number sentence true?

$$9 \times 12 = \square$$

12×9

$12 \div 9$

$12 - 9$

$12 + 9$

A *

B

C

D

2. Which number sentence below demonstrates the identity property of multiplication?

A $6 \times (4 \times 3) = 6 \times 4$

B $3 \times (6 + 5) = (3 \times 6)(3 \times 5)$

C $(175 \times 25) \times 0 = 0$

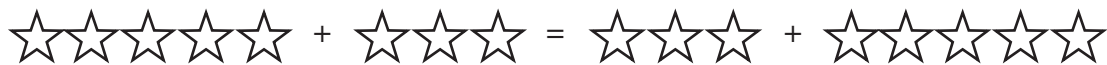
D $(89 + 25) \times 1 = 89 + 25 *$

3. Which of the following expressions would go in the \square to demonstrate the associative property of addition?

$$(14 + 17) + 25 + 9 = \square$$

- A** $25 + (14 + 17) + 9$
B $(17 + 4) + 25 + 9$
C $25 + 9 + (14 + 17)$
D $14 + 17 + (25 + 9)$ *

4. Which property of whole numbers is demonstrated by the picture below?


$$\star\star\star\star\star + \star\star\star = \star\star\star + \star\star\star\star\star$$

- A** Associative property of addition
B Commutative property of addition *
C Associative property of multiplication
D Commutative property of multiplication

5. Which number sentence below demonstrates the associative property of multiplication?

- A** $24 \times (16 \times 11) = (16 \times 11) \times 24$
- B** $(15 \times 27) \times 19 = 15 \times (27 \times 19)$ *
- C** $(61 \times 30) \times 7 = (61 \times 30) \times 7$
- D** $72 \times (5 \times 12) = 72 \times (12 \times 5)$

6. Which property of whole numbers is demonstrated by the number sentence below?

$$12 + 36 + 4 = (12 + 36 + 4) \times 1$$

- A** Identity property of addition
- B** Commutative property of addition
- C** Identity property of multiplication *
- D** Commutative property of multiplication

7. Which number sentence below demonstrates the identity property of addition?

- A** $(36 \times 4) + 19 = 19 + (36 \times 4)$
- B** $0 + (410 \times 10) = 410 \times 10$ *
- C** $(53 + 62) + 113 = 53 + (62 + 113)$
- D** $(104 + 5) \times 1 = 104 + 5$

Answer Key

Content Standard 6

Sample Multiple-Choice

1. A
2. D
3. D
4. B
5. B
6. C
7. B

ALGEBRA

Content Standard 7

Write a number sentence for a problem expressed in words.

Item Type

Multiple-choice

Additional Information

Word problems/real-life situations will be used.

Up to seven-digit numbers may be used.

Money values may be used.

A box may be used.

A variable may be used.

Sample Multiple-Choice Items

1. The distance from Birmingham, Alabama, to Salt Lake City, Utah, is 1781 miles. This distance is 812 miles more than the distance from Birmingham, Alabama, to New York City.

Which number sentence below could be used to determine the distance, in miles, from Birmingham to New York City?

- A** $\square + 1781 = 812$
B $1781 \times 812 = \square$
C $1781 = 812 \div \square$
D $\square = 1781 - 812 *$

2. Kevin wants to buy a video game that costs \$48. He has saved \$16 and earns \$8 each week.

Which number sentence below could be used to find the number of weeks (w) it will take Kevin to earn the rest of the money?

- A** $(48 + 16) \times 8 = w$
B $(48 - 16) \times 8 = w$
C $(48 + 16) \div 8 = w$
D $(48 - 16) \div 8 = w *$

3. A local school district purchased computers and software for its schools. The total cost for the computers was \$1,431,505. The software cost \$68,495.

Which number sentence below could be used to determine the total cost of the computers and the software the school district bought?

- A** $\$1,431,505 - \$68,495 = \square$
B $\$1,431,505 \div \$68,495 = \square$
C $\$1,431,505 + \$68,495 = \square *$
D $\$1,431,595 \times \$68,495 = \square$

5. Betty has 2,916 greeting cards to put into boxes. Each box will hold 18 cards.

Which number sentence below could be used to determine the number of boxes Betty will use for the greeting cards?

- A** $2,916 \div 18 = \square *$
B $\square = 2,916 \times 18$
C $2,916 - \square = 18$
D $\square + 18 = 2,916$

4. The local amusement park had 1,306,250 people visit in 2003. In 2002, the amusement park had 78,500 fewer people visit.

Which number sentence below could be used to determine the number of people who visited the amusement park in 2002?

- A** $1,306,250 \div \square = 78,500$
B $78,500 = 1,306,250 \times \square$
C $1,306,250 - 78,500 = \square *$
D $\square = 1,306,250 + 78,500$

6. Georgia became a state in 1788.
Alabama became a state 31 years later.

Which number sentence below could be used to determine the year Alabama became a state?

- A** $1,788 - \square = 31$
B $\square + 1,788 = 31$
C $31 + \square = 1,788$
D $\square - 31 = 1,788$ *

8. There are 1432 students in Victoria Middle School. There are 145 fewer students at Miller Middle School.

Which number sentence below could be used to determine the number of students in Miller Middle School?

- A** $\square = 1,432 - 145$ *
B $\square = 1,432 + 145$
C $\square = 1,432 \times 145$
D $\square = 1,432 \div 145$

7. Jill and Mark collected cans for recycling. Mark collected 91 cans. He collected 13 fewer cans than Jill.

Which number sentence below could be used to find the total number of cans (j) that Jill collected?

- A** $j - 13 = 91$ *
B $91 - 13 = j$
C $j \times 13 = 91$
D $91 \times 13 = j$

9. The population of Phoenix is 1,321,045, the population of San Antonio is 1,144,646, and the population of Huntsville is 158,216.

Which number sentence below could be used to determine the difference between the population of Phoenix and the combined populations of Huntsville and San Antonio?

- A** $1,321,045 + (1,144,646 - 158,216) = \square$
- B** $1,321,045 - (1,144,646 + 158,216) = \square *$
- C** $1,321,045 + (1,144,646 + 158,216) = \square$
- D** $1,321,045 - (1,144,646 - 158,216) = \square$

Answer Key

Content Standard 7

Sample Multiple-Choice

1. D
2. D
3. C
4. C
5. A
6. D
7. A
8. A
9. B

GEOMETRY

Content Standard 8

Identify regular polygons and congruent polygons.

Item Type

Multiple-choice

Additional Information

No word problems/real-life situations will be used.

Graphics will be used.

Length of sides and measures of angles will be given.

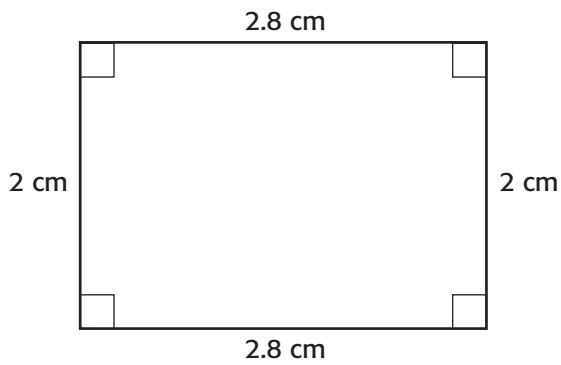
Right angles will be noted.

One of the two congruent polygons may be rotated.

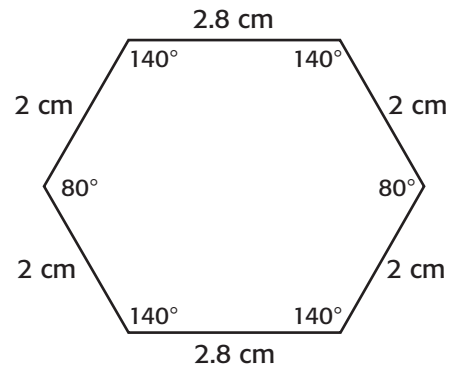
Sample Multiple-Choice Items

(continued on next page)

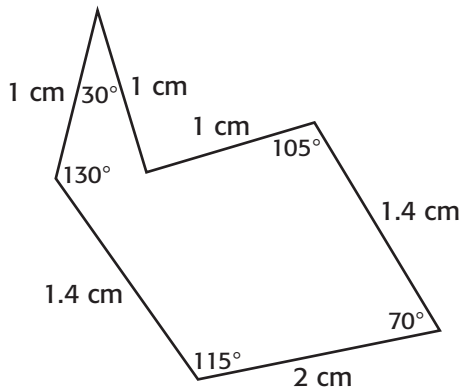
1. Which of the following is a regular polygon?



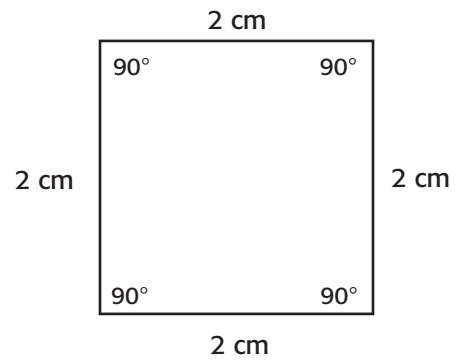
A



C

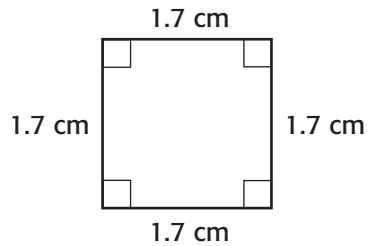


B

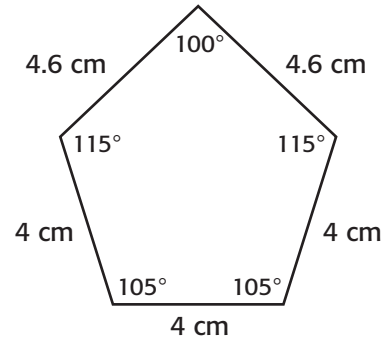


D *

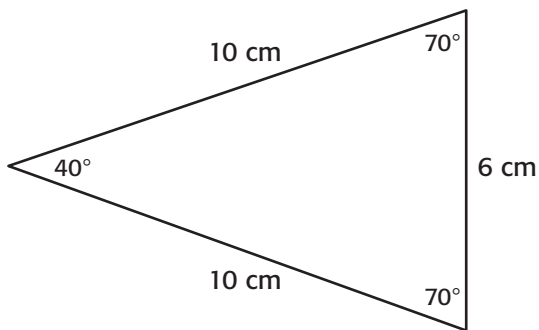
2. Which of the following is a regular polygon?



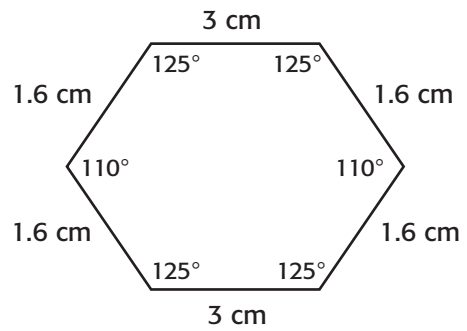
A *



C

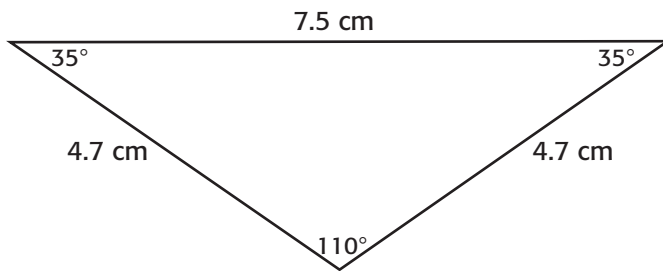
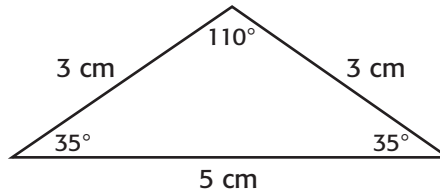


B

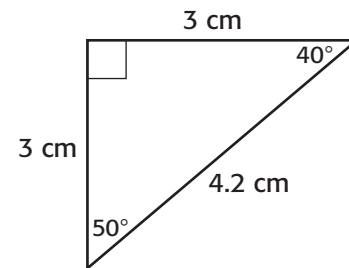


D

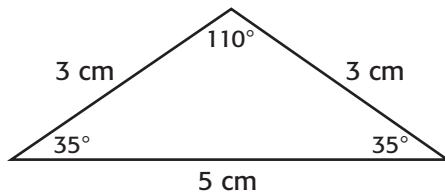
3. Which of the following is congruent to the triangle below?



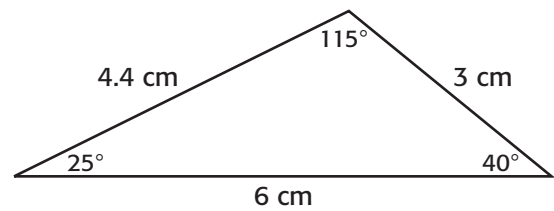
A



C

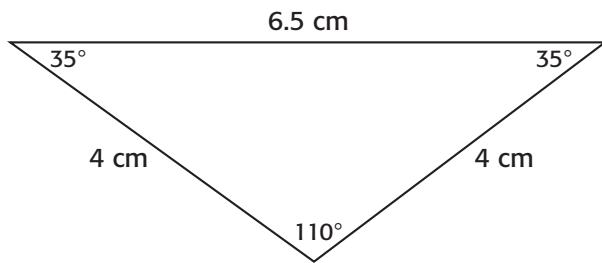
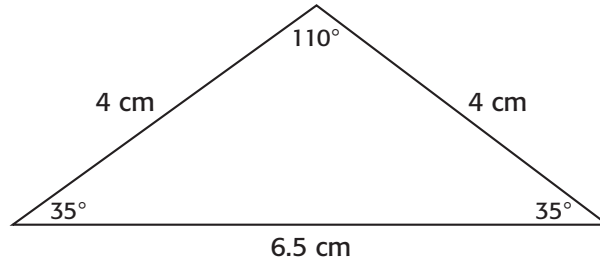


B *

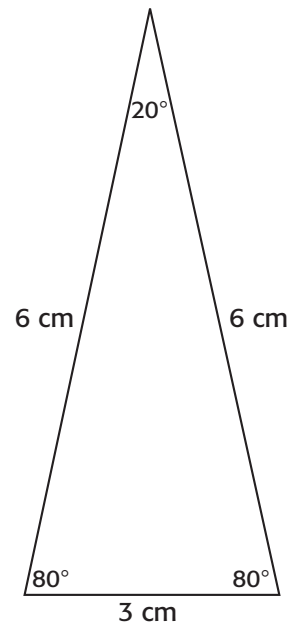


D

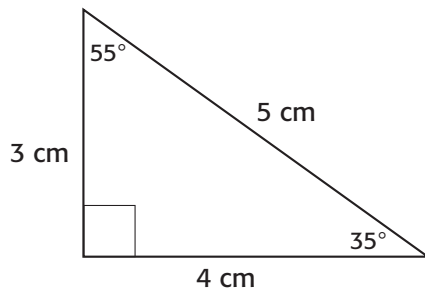
4. Which of the following is congruent to the triangle below?



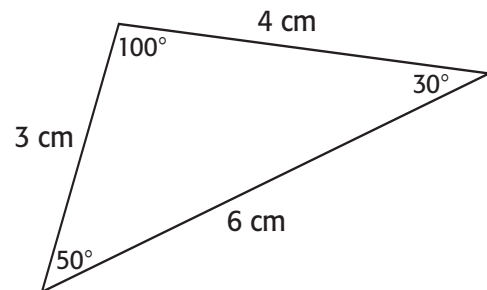
A *



C

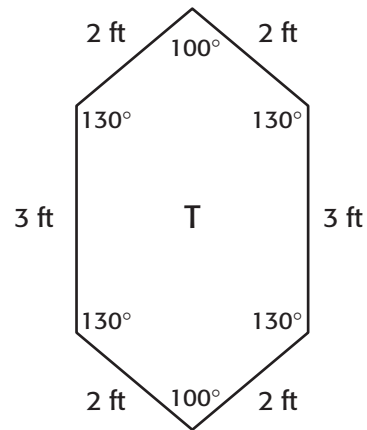
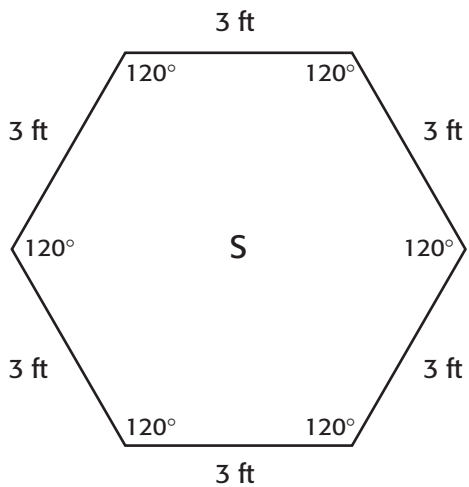
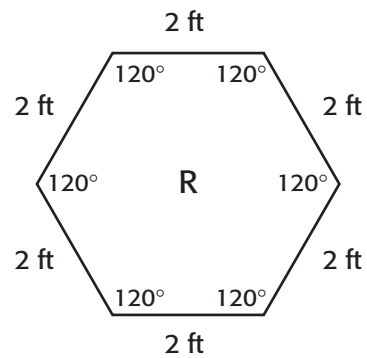
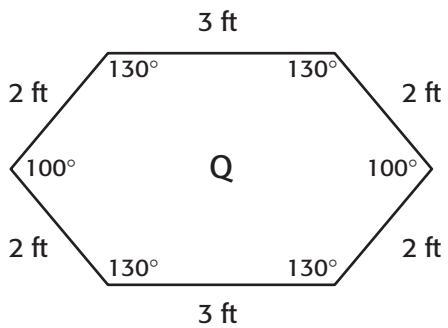


B



D

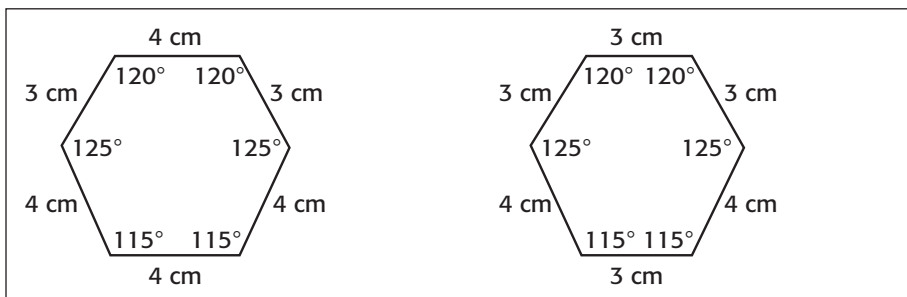
5. Which 2 figures are congruent?



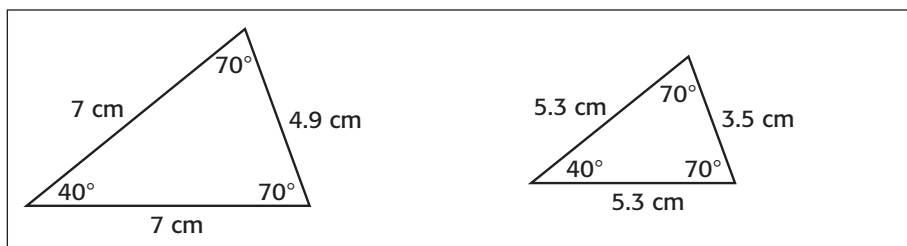
- A** Q and R
- B** R and S
- C** S and T
- D** T and Q *

6. Which of the following represents a pair of congruent polygons?

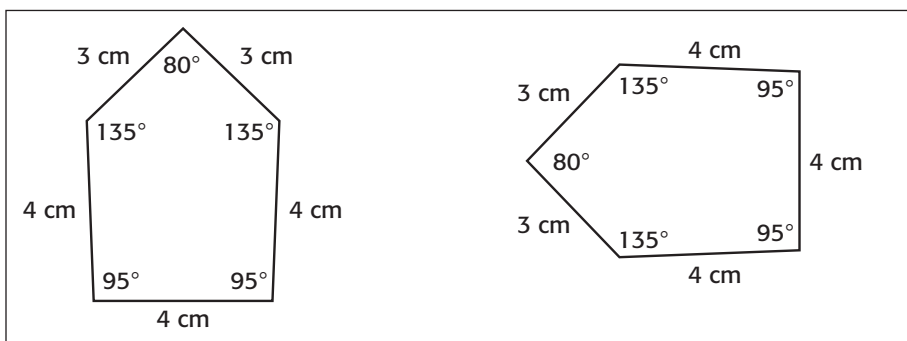
A



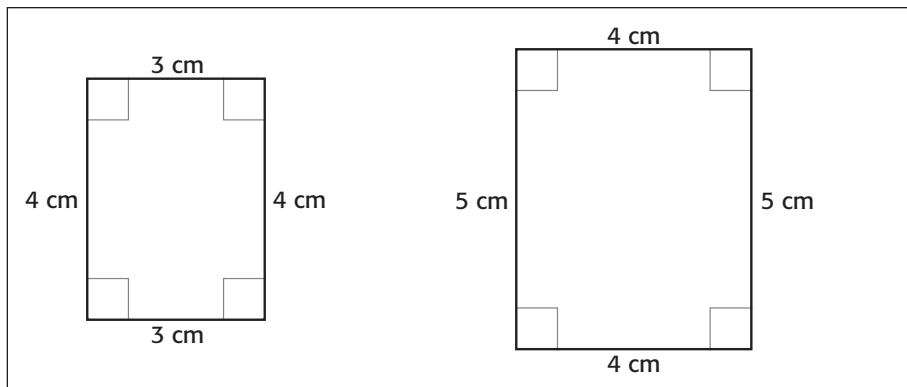
B



C *



D



Answer Key

Content Standard 8

Sample Multiple-Choice

1. D
2. A
3. B
4. A
5. D
6. C

GEOMETRY**Content Standard 9**

Identify components of the Cartesian plane, including the x -axis, y -axis, origin, and quadrants.

Item Type

Open-ended

Additional Information

Word problems/real-life situations will be used.

All parts must be labeled.

Axis will be drawn in answer box.

Sample Open-Ended Items

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

1. Jake drew a Cartesian plane on his paper.
 - a. Label the Cartesian plane located in your answer document.
 - b. Jake marked two points on the Cartesian plane, point A in Quadrant I and point B in Quadrant II. He connected point A to point B with a line segment. Draw what Jake did.
 - c. Identify the axis this line segment crosses.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

2. Janey drew a Cartesian plane. In Quadrant II, she marked and labeled point J .
 - a. Label the Cartesian plane located in your answer document. In Quadrant II, mark and label a point J that could represent the point Janey marked.
 - b. Janey marked and labeled a second point, K . A line segment with J and K as endpoints crosses the x -axis. On the Cartesian plane, mark and label a point K that could represent the second point that Janey marked.
 - c. Janey also marked and labeled the origin, M . On the Cartesian plane, mark and label the origin M .

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

3. Label the Cartesian plane located in your answer document.
 - a. Mark a point 2 units directly to the left of the origin. Label it point R .
 - b. Label Quadrant II.
 - c. Label Quadrant III.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

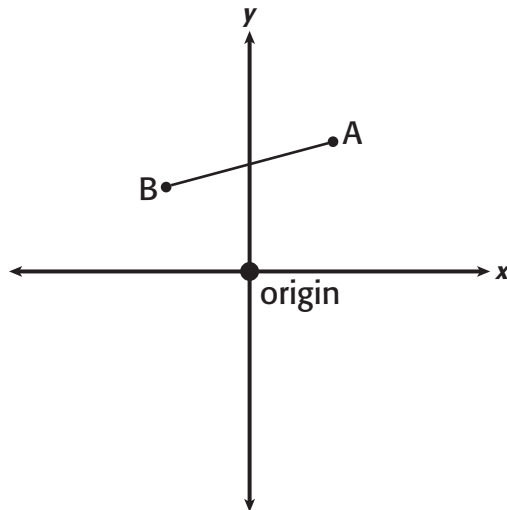
This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

4. A map for a scavenger hunt is drawn on a Cartesian plane.
 - a. Label the Cartesian plane located in your answer document.
 - b. The starting point for the scavenger hunt is on the axis, between Quadrant III and Quadrant IV. Mark a point on the axis between Quadrant III and Quadrant IV and label it *S*.
 - c. The first clue is located in Quadrant I. Mark a point in Quadrant I and label it *C*.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

Sample Open-Ended**1. Sample Response(s):**

- a. A Cartesian plane is drawn and labeled.



OR

Equivalent

- b. A point is marked in Quadrant I AND labeled “A” AND a point is marked in Quadrant II AND labeled “B” AND the two points are connected with a line segment.

OR

Equivalent

- c. y-axis or vertical axis

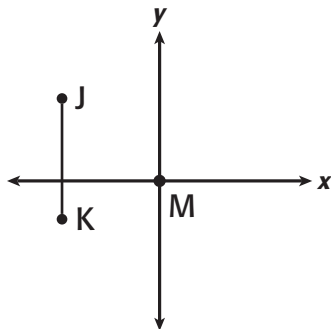
OR

Equivalent

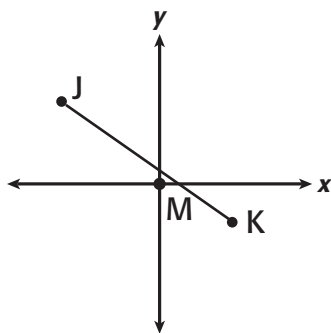
Score Point	Response Attributes
3	All is correct.
2	Graph has 1–3 errors and at least 2 correct answers for Parts a, b, or c.
1	Part a has more than 3 errors. OR At least 1 answer to Part b or c is correct.
0	No graph or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

2. Sample Response(s):

- a. A Cartesian plane is drawn and labeled AND a point is marked in Quadrant II AND the point is labeled “J.”



OR

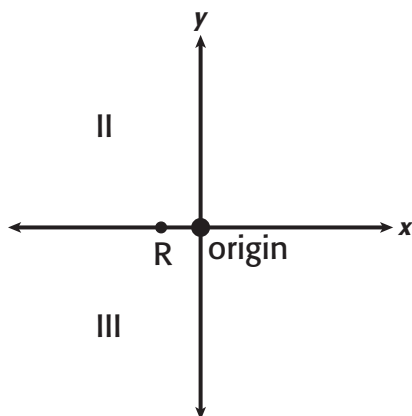


- b. A point is marked in Quadrant III or IV AND labeled “K.”
- c. The origin is marked with a point AND labeled “M.”

Score Point	Response Attributes
3	All is correct.
2	Graph has 1–3 errors and at least 2 correct answers for Parts a, b, or c.
1	Part a has more than 3 errors. OR At least 1 answer to Part b or c is correct.
0	No graph or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

3. Sample Response(s):

A Cartesian plane is drawn and labeled.



- a. A point is marked 2 units to the left of the origin AND labeled “R.”

OR

Equivalent

- b. Quadrant II is labeled.

OR

Equivalent

- c. Quadrant III is labeled.

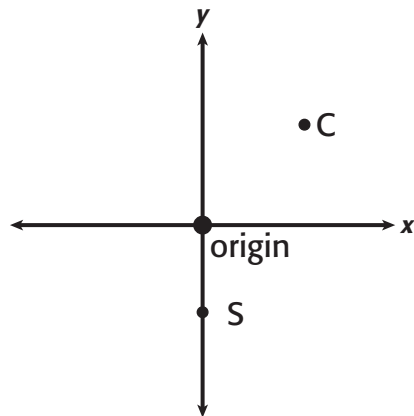
OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Graph has 1–3 errors and at least 2 correct answers for Parts a, b and c.
1	Part a has more than 3 errors. OR At least 1 answer to Part b or c is correct.
0	No graph or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

4. Sample Response(s):

- a. A Cartesian plane is drawn and labeled.



- b. A point is marked below the origin on the y-axis AND labeled “S.”
- c. A point is marked in Quadrant I AND labeled “C.”

Score Point	Response Attributes
3	All is correct.
2	Graph has 1–3 errors and at least 2 correct answers for Parts a, b, or c.
1	Part a has more than 3 errors. OR At least 1 answer to Part b or c is correct.
0	No graph or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

GEOMETRY

Content Standard 10

Identify the center, radius, and diameter of a circle.

Item Type

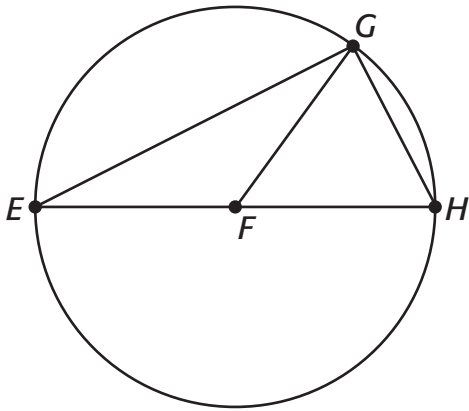
Multiple-choice

Additional Information

No word problems/real-life situations will be used.
Graphics will be used.

Sample Multiple-Choice Items

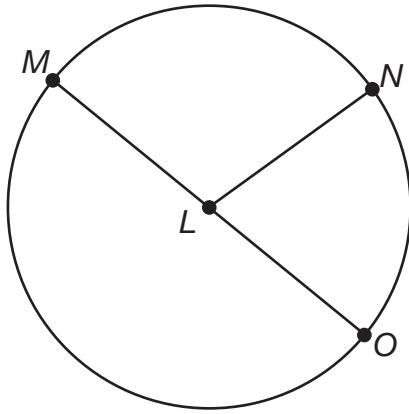
Points E , G , and H are on circle F below.



1. Which of the following segments *best* represents a diameter of circle F ?

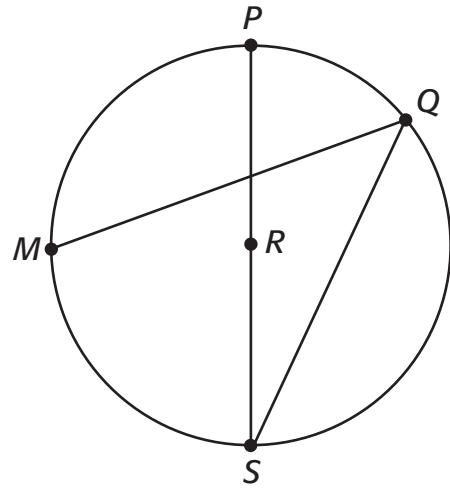
 \overline{GH} **A** \overline{EH} **B *** \overline{GF} **C** \overline{EG} **D**

2. Which statement about the circle below is true?



- A** \overline{MN} is a radius of the circle.
- B** L is the center of the circle. *
- C** N is the center of the circle.
- D** \overline{LN} is a diameter of the circle.

- Points P , Q , S , and M are on circle R below.



3. Which of the following segments is a radius of circle R ?

\overline{PR}

A *

\overline{MQ}

B

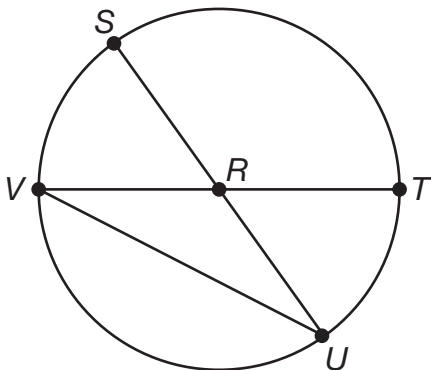
\overline{PS}

C

\overline{QS}

D

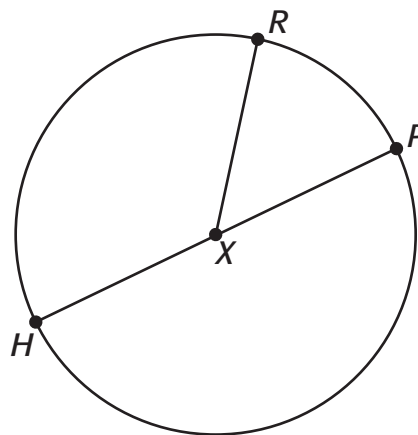
Points S , T , U , and V are on circle R below.



4. Which segment on circle R is the same length as \overline{SU} ?

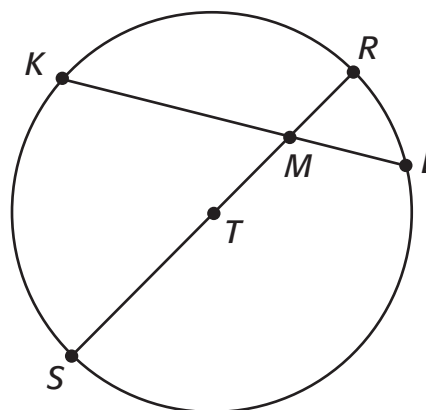
A \overline{RV}
B \overline{SR}
C \overline{TV} *
D \overline{VU}

5. Which of the following *best* represents the center of the circle below?



H R P X
A **B** **C** **D** *

6. Which letter *best* represents the center of the circle below?



R L T K
A **B** **C** * **D**

Answer Key

Content Standard 10

Sample Multiple-Choice

1. B
2. B
3. A
4. C
5. D
6. C

MEASUREMENT

Content Standard 11

Estimate perimeter and area of irregular shapes using unit squares and grid paper.

Item Type

Multiple-choice

Additional Information

No word problems/real-life situations will be used.

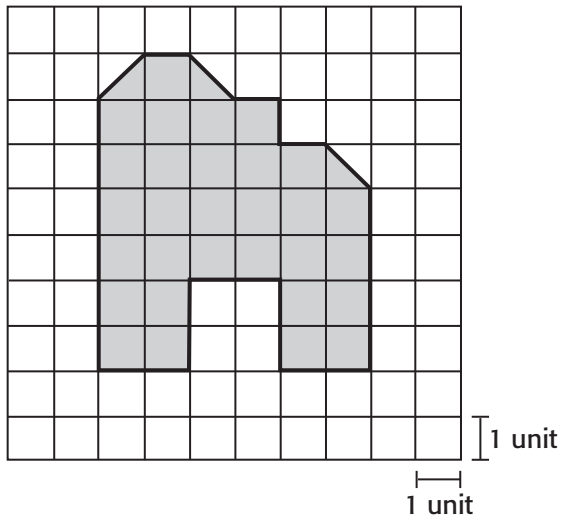
Graphics will be used.

Shapes will be shown using grid paper and unit squares.

In estimating perimeter and area, *closest* may be used.

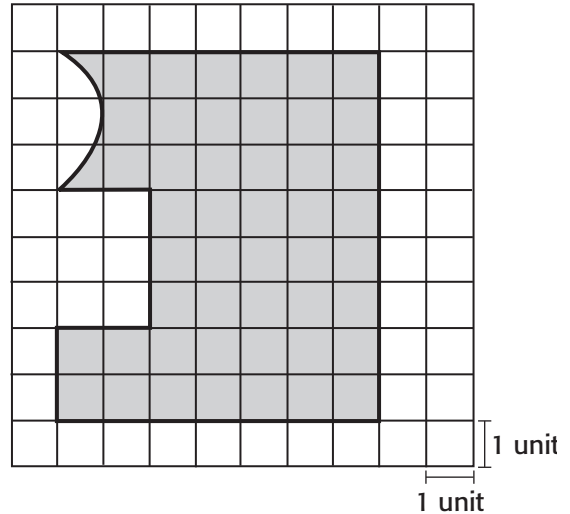
Sample Multiple-Choice Items

1. Which is *closest* to the perimeter, in units, of the shaded figure below?



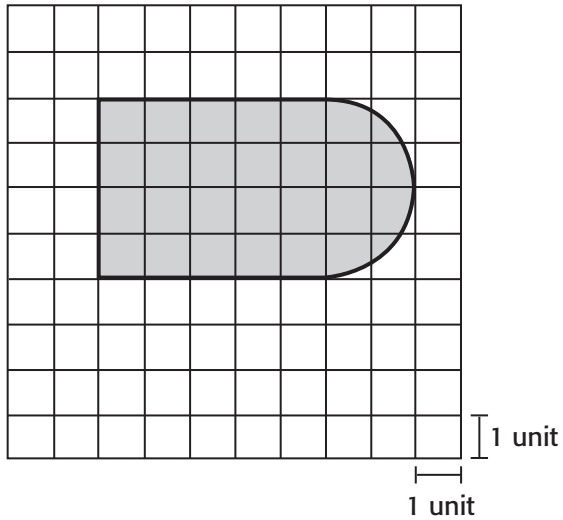
- 24 27 30 31
A **B *** **C** **D**

2. Which is *closest* to the perimeter, in units, of the shaded figure below?



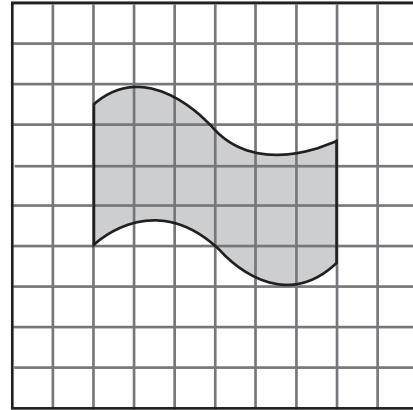
- 56 48 42 34
A **B** **C** **D ***

3. Which is *closest* to the perimeter, in units, of the shaded figure below?



- 14 20 24 26
- A** **B *** **C** **D**

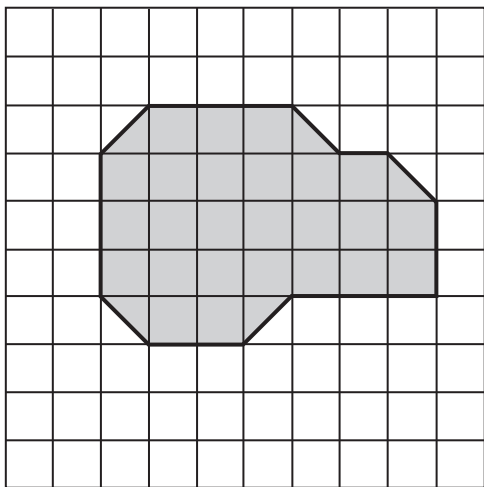
4. Which is *closest* to the area, in square units, of the shaded figure below?




□ = 1 square unit

- A** 12 square units
- B** 18 square units *
- C** 24 square units
- D** 30 square units

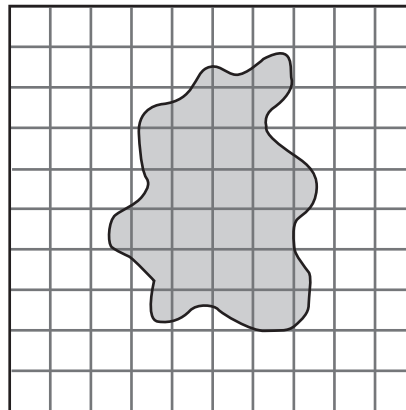
5. Which is *closest* to the area, in square units, of the shaded figure below?



 = 1 square unit

- 19 25.5 27.5 35
A **B** **C *** **D**

6. Which is *closest* to the area, in square units, of the shaded figure below?



 = 1 square unit

- A** 14 square units
B 24 square units *
C 34 square units
D 42 square units

Answer Key

Content Standard 11

Sample Multiple-Choice

1. B
2. D
3. B
4. B
5. C
6. B

MEASUREMENT**Content Standard 12**

Calculate the perimeter of rectangles from measured dimensions.

Item Type

Multiple-choice

Gridded

Additional Information

No word problems/real-life situations will be used.

Graphics may be used.

Measured dimensions will be given.

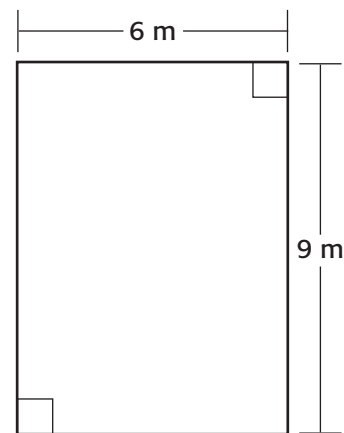
Metric or customary units will be used.

Sample Multiple-Choice Items

1. What is the perimeter, in meters, of a rectangle that is 13 meters long and 10 meters wide?

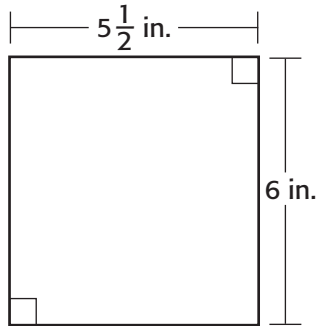
23 33 36 46
A **B** **C** **D ***

2. What is the perimeter, in meters, of the rectangle below?



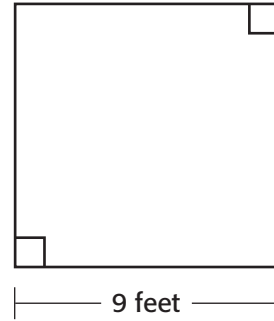
15 24 30 54
A **B** **C *** **D**

3. What is the perimeter, in inches, of the rectangle shown below?



- $30\frac{1}{2}$ 23 17 $11\frac{1}{2}$
A **B *** **C** **D**

5. What is the perimeter, in feet, of the square below?



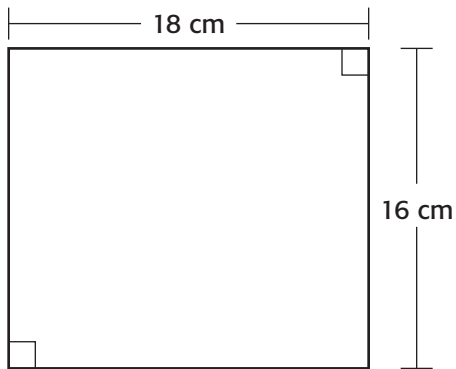
- 9 18 36 81
A **B** **C *** **D**

4. What is the perimeter, in centimeters, of a rectangle that is 4 centimeters wide and 16 centimeters long?

- 20 36 40 64
A **B** **C *** **D**

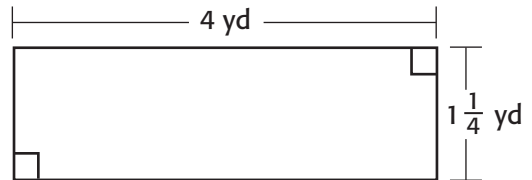
Sample Gridded Items

1. What is the perimeter, in centimeters, of the rectangle shown below?



Mark your answer in the answer grid.

2. What is the perimeter, in yards, of the rectangle shown below?



Mark your answer in the answer grid.

Answer Key

Content Standard 12

Sample Multiple-Choice

1. D
2. C
3. B
4. C
5. C

Sample Gridded

1. 68
2. $10\frac{1}{2}$ or 10.5

MEASUREMENT**Content Standard 13**

Convert a larger unit of measurement to a smaller unit of measurement within the same system, customary or metric.

Item Type

Multiple-choice
Gridded

Additional Information

Word problems/real-life situations may be used.
Conversion units will not be provided.
Each conversion will be within the same system.

Sample Multiple-Choice Items

1. On Tuesday, Takara drank 3 pints of bottled water.
- What is the total number of *ounces* in 3 pints?

64 48 24 6
A **B *** **C** **D**

2. Dwayne uses 2 quarts of milk in 1 week.
- What is the total number of *cups* in 2 quarts?

16 12 8 4
A **B** **C *** **D**

3. Amy's dog weighs 14 pounds.
- What is the dog's weight in *ounces*?

30 64 210 224
A **B** **C** **D ***

4. Max has 4 gallons of pickles.

What is the total number of *pints* of pickles Max has?

8 16 32 64
A **B** **C *** **D**

6. The zebra at a zoo weighs 500 kilograms.

What is the total number of *grams* in 500 kilograms?

A 5
B 50
C 50,000
D 500,000 *

5. Jim has 16 gallons of orange juice.

What is the total number of *cups* of orange juice Jim has?

256 128 64 2
A * **B** **C** **D**

7. Sierra ran 250 meters while playing a game.

What is the total number of *centimeters* in 250 meters?

- A** 2,500
B 25,000 *
C 250,000
D 2,500,000

9. The length of Mr. Whitcomb's garden hose is 5 yards.

What is the total number of *feet* in 5 yards?

- | | | | |
|----------|------------|----------|----------|
| 8 | 15 | 50 | 60 |
| A | B * | C | D |

8. Taang's family lives 150 kilometers from his aunt.

What is the total number of *meters* in 150 kilometers?

- | | |
|----------------|--------------------|
| A 15 | C 15,000 |
| B 1,500 | D 150,000 * |

10. Scott played with his friends for 2 hours on Saturday.

What is the total number of *seconds* Scott played with his friends on Saturday?

- | | | | |
|----------|----------|----------|------------|
| 60 | 120 | 3,600 | 7,200 |
| A | B | C | D * |

Sample Gridded Items

1. The distance from Jonna's house to her school is 147 yards.

What is the total number of *inches* in 147 yards?

Mark your answer in the answer grid.

3. Nancy is 5 feet tall.

What is the total number of *inches* in 5 feet?

Mark your answer in the answer grid.

2. Carolyn lives 3 miles from the post office.

What is the total number of *yards* in 3 miles?

Mark your answer in the answer grid.

4. An elephant at the zoo weighs 3 tons.

What is the total number of *pounds* in 3 tons?

Mark your answer in the answer grid.

Answer Key

Content Standard 13

Sample Multiple-Choice

1. B
2. C
3. D
4. C
5. A
6. D
7. B
8. D
9. B
10. D

Sample Gridded

1. 5292
2. 5280
3. 60
4. 6000

DATA ANALYSIS AND PROBABILITY

Content Standard 14

Analyze data collected from a survey or experiment to distinguish between what the data show and what might account for the results.

Item Type

Multiple-choice

Open-ended

Additional Information

Word problems/real-life situations will be used.

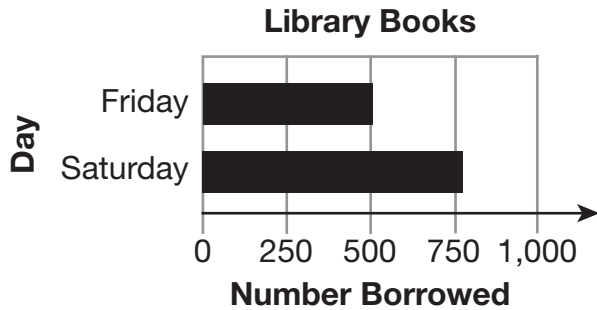
Tables and charts may be used.

Time may be used.

Sample Multiple-Choice Items

(continued on next page)

The bar graph below shows the number of books borrowed from a library on Friday and Saturday.

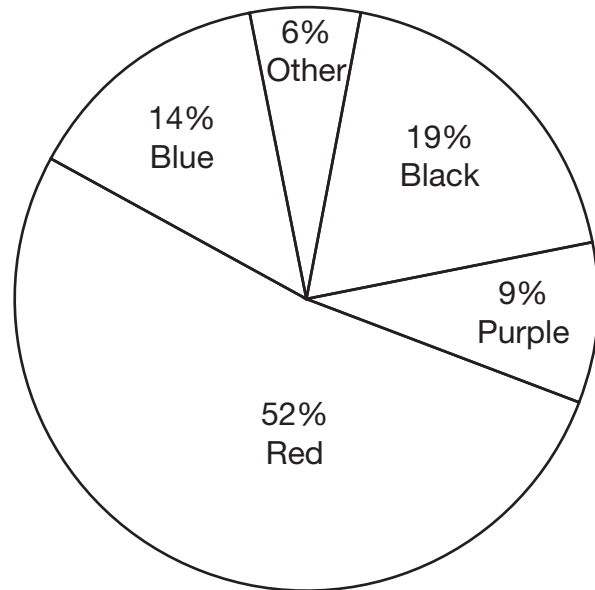


1. Which is *most likely* the reason more books were borrowed on Saturday than on Friday?

- A** The library was open longer on Friday.
- B** More people visited the library on Saturday. *
- C** There were fewer books available on Saturday.
- D** More people wanted something to read on Friday.

Elliott counted the number of T-shirts of each color worn by students at a pep rally. The results are shown in the circle graph below.

Color of T-shirts Worn at a Pep Rally



2. According to the graph, which would *most likely* be Elliott's school color?

- A** Blue
- B** Black
- C** Purple
- D** Red *

The table below shows the total number of points scored by Amanda's basketball team at six practices.

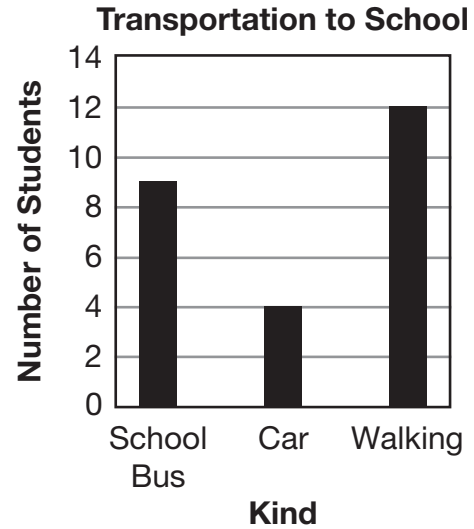
Amanda's Basketball Team

Practice	Points
1	70
2	72
3	75
4	81
5	86
6	94

3. Which is *most likely* the reason the number of points scored by Amanda's team increased at each practice?

- A** Fewer players came to practice.
- B** The team's practice times got shorter.
- C** The players' basketball skills were improving. *
- D** The players spent more time running at practice.

The bar graph below shows the kind of transportation Mrs. Martin's students used to get to school that morning.



4. Which is *most likely* the reason the number of students walking to school was *greatest*?

- A** It was raining.
- B** The cars students used to get to school were working.
- C** The students live close to the school. *
- D** The school buses were on time that morning.

The points scored by Julia and her teammates during a basketball game are shown in the table below.

Basketball Game

Player	Points Scored
Diane	6
Lucy	3
Grace	4
Amelia	2
Julia	10
Michaela	5
Bridget	4

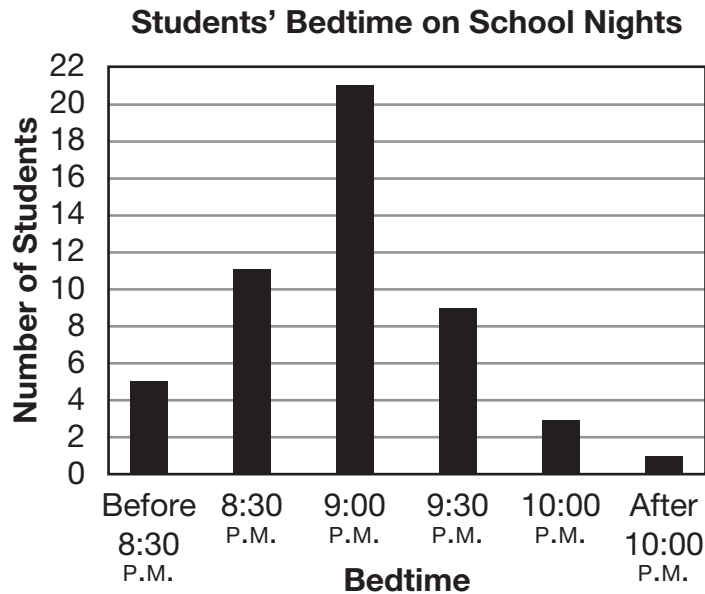
5. Which is *most likely* the reason Julia scored more points than her teammates?

- A** Julia has two siblings.
- B** Julia wore new basketball shoes.
- C** Julia is a better softball player than her teammates.
- D** Julia had more playing time than any of her teammates. *

Sample Open-Ended Items

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

1. Ricardo surveyed the students in his classes to determine their usual bedtime on school nights. The bar graph below shows his results.



- What is the bedtime of the *greatest* number of students in Ricardo's survey?
- Give 2 *possible* reasons that could explain why students have different bedtimes.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

2. The table below shows the number of lawnmowers sold by a local store during selected months last year.

**Lawnmower Sales During
Selected Months**

Month	Number of Lawnmowers Sold
March	17
May	42
July	23
September	12
December	5

- During which month was the *greatest* number of lawnmowers sold?
- Give 2 *possible* reasons that could explain why different numbers of lawnmowers were sold in different months.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

3. One day in January, Marissa recorded the outdoor temperature near her house five different times between noon and 9:00 P.M. The table below shows the temperature measurements at the 5 different times.

Marissa's Outdoor Temperature Measurements

Temperature Measurement	Temperature (in degrees Fahrenheit)
1	52
2	58
3	58
4	64
5	41

- At which measurement was the temperature the highest?
- Using the given range of times at which Marissa measured the temperature, give 1 *possible* reason temperature measurement 2 and temperature measurement 3 are equal.
- Using the given range of times at which Marissa measured the temperature, give 1 *possible* reason temperature measurement 5 is the lowest

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

4. Kylie went biking on 8 different days and recorded the number of minutes for each bike ride in the table below. She biked the same distance each day.

Kylie's Bike Rides

Day	Minutes
1	60
2	55
3	65
4	54
5	90
6	58
7	53
8	62

- On which day did Kylie bike the *least* number of minutes?
- Give 2 *possible* reasons why the bike ride on day 5 took the greatest number of minutes.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

Answer Key

Content Standard 14

Sample Multiple-Choice

1. B
2. D
3. C
4. C
5. D

Answer Key

Content Standard 14

Sample Open-Ended

1. Sample Response(s):

- a. 9:00 P.M. is the bedtime for the greatest number of students. I looked at the bar graph and the greatest number is 21.
- b. One reason students might have different bedtimes is because of parents. Some parents make students go to bed earlier than other parents.

Another reason students might have different bedtimes is because of sports. If students have to play a game during the week they might not get home until a later time.

Score Point	Response Attributes
3	All is correct.
2	Both logics are correct. OR One logic is correct and the answer is correct.
1	One logic is correct. OR The answer is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

2. Sample Response(s):

- a. The month of May had the greatest number of lawnmowers sold. I looked at the chart and the greatest number is 42.
- b. One reason there could have been a different number of lawnmowers sold is because in May the grass is starting to grow back and so more people have to cut their lawn. In December it is wintertime and not many people are cutting their lawns.

Another reason there could have been a different number of lawnmowers sold is because spring is a time for planting grass and winter is not a good time to plant grass.

Score Point	Response Attributes
3	All is correct.
2	Both logics are correct. OR One logic is correct and the answer is correct.
1	One logic is correct. OR The answer is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

3. Sample Response(s):

a. 4

b. One *possible* reason might be that it was cloudy, so the temperature stopped rising.

OR

Equivalent

c. One *possible* reason might be that it was evening so the sun was down and the air cooled off.

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Two logics are correct. OR One logic and one answer are correct.
1	One answer is correct without logic. OR One logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

4. Sample Response(s):

- a. Day 7
- b. One *possible* reason why the bike ride on day 5 took the greatest number of minutes is because Kylie stopped along the way for the longest time of any of the days.

OR

Equivalent

Another *possible* reason is that she rode her bike the slowest on day 5, etc.

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Both logics are correct. OR One logic is correct and the answer is correct.
1	One logic is correct. OR One answer is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off-task, etc., scored as invalid.)

DATA ANALYSIS AND PROBABILITY**Content Standard 15**

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

Item Type

Multiple-choice

Gridded

Additional Information

Word problems/real-life situations will be used.

Tables and charts may be used.

Graphics may be used.

Answers will never be certain (100%) or impossible (0%).

Answers for gridded items will be expressed in fractions.

Answers and distractors for multiple-choice items will be fractions.

Reducing fractions may be required.

Sample Multiple-Choice Items

1. Each letter in the word W A S H I N G T O N is written on a separate piece of paper. Each piece of paper is the same size. The pieces of paper are put into a bag. One of the pieces of paper is selected from the bag at random.

What is the probability the letter on the first piece of paper selected will be an A, an I, or an O?

$$\frac{3}{10}$$

A *

$$\frac{4}{10}$$

B

$$\frac{6}{10}$$

C

$$\frac{7}{10}$$

D

2. Elizabeth had 3 orange marbles, 2 green marbles, and 3 yellow marbles in a bag. There were no other marbles in the bag. Without looking, Elizabeth selected a marble from the bag.

What is the probability Elizabeth selected an orange marble from the bag?

$$\frac{2}{8}$$

A

$$\frac{3}{8}$$

B *

$$\frac{5}{8}$$

C

$$\frac{6}{8}$$

D

3. Each letter in the word C H A T T A H O O C H E E is written on a separate piece of paper. Each piece of paper is the same size. The pieces of paper are put into a bag. One of the pieces of paper is selected from the bag at random.

What is the probability the letter on the first piece of paper selected will be an H?

$\frac{2}{13}$

A

$\frac{3}{13}$

B *

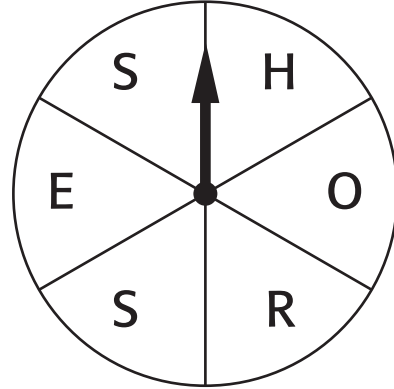
$\frac{6}{13}$

C

$\frac{10}{13}$

D

The spinner shown below is divided into 6 equal sections. Each of the letters in the word H O R S E S is put on the spinner as shown.



5. What is the probability on the first spin the arrow will land on a space with the letter S?

$\frac{5}{6}$

A

$\frac{4}{6}$

B

$\frac{3}{6}$

C

$\frac{2}{6}$

D *

4. Jamal had a bag that had 4 orange marbles, 5 green marbles, and 6 white marbles. There were no other marbles in the bag. Jamal selected a marble from the bag without looking.

What is the probability Jamal selected a white marble?

$\frac{4}{15}$

A

$\frac{5}{15}$

B

$\frac{6}{15}$

C *

$\frac{9}{15}$

D

Sample Gridded Items

1. Jerry, Sandra, Peggy, Albert, and Sharon are on a basketball team. For the game on Tuesday, one of these players will be selected at random to be captain.

What is the probability either *Jerry* or *Albert* will be selected to be captain of the game on Tuesday?

Express your answer as a fraction.

Mark your answer in the answer grid.

The table below shows the hair color of all students in Gerry's class.

Hair Color of Students

Hair Color	Number of Students
Red	2
Brown	13
Black	4
Blond	6

2. What is the probability a student selected at random from Gerry's class will have blond hair?

Express your answer as a fraction.

Mark your answer in the answer grid.

3. On Monday, Travis, Maggie, Ellie, and Earl rode to school with Ellie's mother. Ellie's mother selected a child at random to sit in the front seat.

What is the probability that on Monday Ellie's mom selected Travis to sit in the front seat?

Express your answer as a fraction.

Mark your answer in the answer grid.

4. There were 25 students who attended a club meeting. From those in attendance, a student was selected at random to win a prize. Carrie attended the meeting.

What is the probability Carrie was selected to win the prize?

Express your answer as a fraction.

Mark your answer in the answer grid.

Answer Key

Content Standard 15

Sample Multiple-Choice

1. A
2. B
3. B
4. C
5. D

Sample Gridded

1. $\frac{2}{5}$
2. $\frac{6}{25}$
3. $\frac{1}{4}$
4. $\frac{1}{25}$

SAMPLE RESPONSE FORMAT

SAMPLE RESPONSE: MULTIPLE-CHOICE

Page _____

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

Page _____

6	(A)	(B)	(C)	(D)
7	(A)	(B)	(C)	(D)
8	(A)	(B)	(C)	(D)

Page _____

9	(A)	(B)	(C)	(D)
10	(A)	(B)	(C)	(D)

Page _____

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SAMPLE RESPONSE: OPEN-ENDED

Page ____ Be sure to leave room in your answer space for all parts of this test question.

Question 1*Answer question 1 in this box.*

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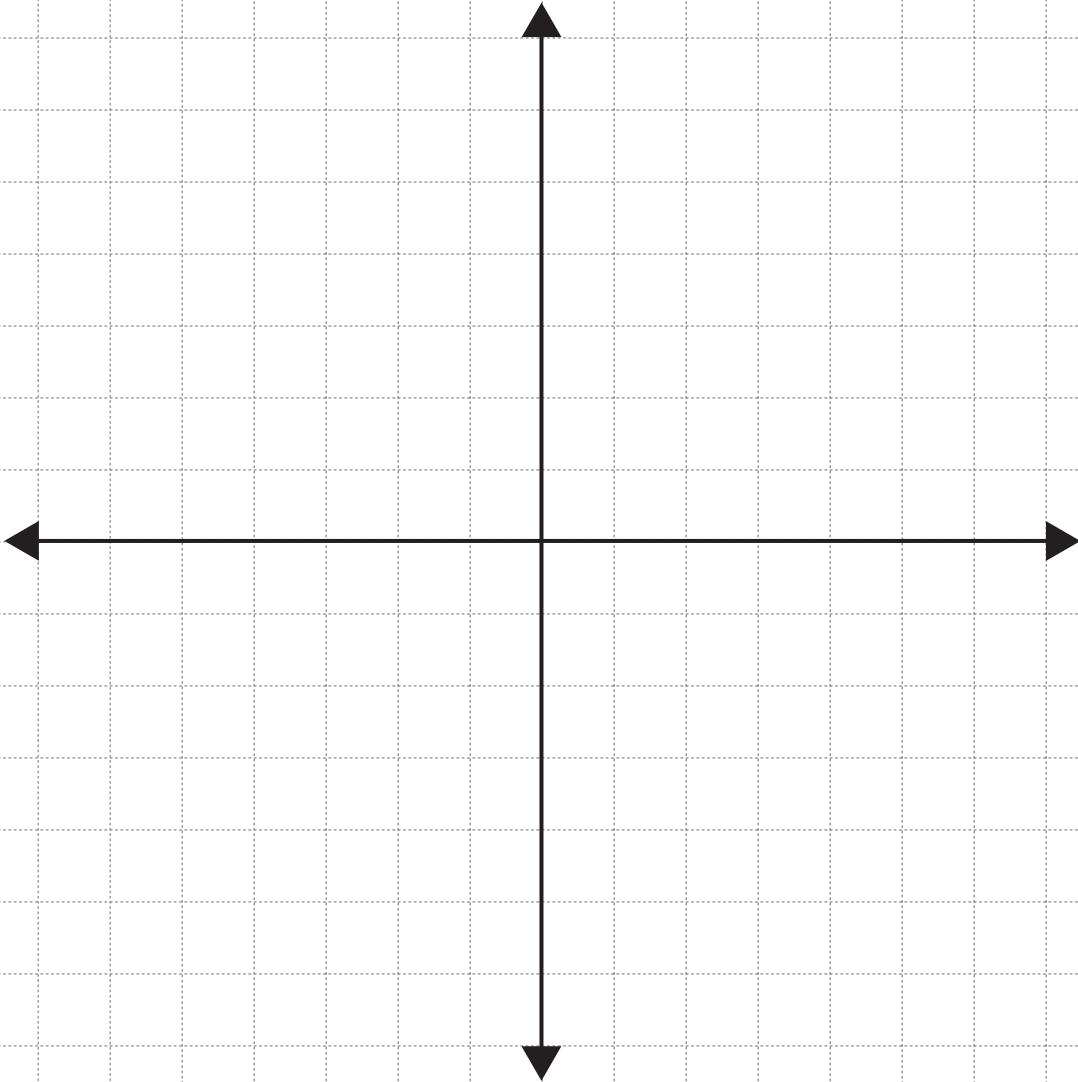
SAMPLE RESPONSE: OPEN-ENDED (Standard 9)

Page ____ Be sure to leave room in your answer space for all parts of this test question.

Question 2*Answer question 2 in this box.*

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