Mathematics Assessment
Updates for 2012

Measurements of Student Progress
Grades 6-8

Table of Contents

Measurements of Student Progress Development Information 3

- Washington State K-12 Mathematics Learning Standards 3
- Test and Item Specifications 3
- Performance Level Descriptors 4
- MSP Testing Windows 5
- Online Testing 5

Grades 6-8 Information 6

- Mathematics Formula Sheet for Grades 6-8 MSP 6
- Calculator Use and Restrictions Policy 6
- Manipulatives and Tools Allowed 7

Common Core State Standards Updates 9
Resources 9

- 2011 Lessons Learned from Scoring Student Work 9
- Online Supports 9
- Teacher Tool 10
- Sample Items for Classroom Use 10

New Samples for 2012 11

- Grade 6 11
- Grade 7 25
- Grade 8 47

Other Sources of Sample Grade 6-8 MSP Items 65
Contact Information 66

Introduction

Updates for 2012 contains pertinent information for Washington educators. This document includes a summary of changes and new information in mathematics assessment, links to resources for teachers, and sample test items. *Updates for 2012* has been customized into grade bands: Grades 3-5, Grades 6-8, and End-of-Course Assessments. The documents are available on http://www.k12.wa.us/Mathematics/default.aspx.

Measurements of Student Progress Development Information

Washington State K-12 Mathematics Learning Standards

In 2008, the State Board of Education voted to approve the revised K-8 Mathematics Learning Standards and 9-12 Mathematics Learning Standards for adoption by the Office of Superintendent of Public Instruction (OSPI). Along with the new standards, the legislature provided direction for the redesign of the assessment system. The Measurements of Student Progress (MSP) replaced the Washington Assessment of Student Learning (WASL) and assessed the new mathematics standards in grades 3-8 starting in the spring of 2010. End-of-course (EOC) exams replaced the High School Proficiency Exam (HSPE) starting in 2011. These EOC exams assess the Algebra 1/Integrated Mathematics 1 and Geometry/Integrated Mathematics 2 performance expectations.

View the Washington State K-12 Mathematics Learning Standards at:
http://www.k12.wa.us/Mathematics/Standards.aspx

Test and Item Specifications

The Test and Item Specifications provide guidelines for developing large-scale assessments based on the Washington State K-12 Mathematics Learning Standards that assess the levels of proficiency students have achieved.

The test specifications provide a grade-level or course test map that delineates the type and number of test items in each Area of Emphasis.

The Test and Item Specifications are periodically updated. Included with each updated version of the Test and Item Specifications will be a summary of the changes made since the previous version. Updates made to the Test and Item Specifications do not indicate changes to which standards (performance expectations) are being assessed; the test content and test map remain the same. The updates address questions from educators requesting clarification of performance expectation scope and/or limitation. The Test and Item Specifications can be accessed through the following link:
http://www.k12.wa.us/Mathematics/TestItemSpec.aspx.

Vocabulary Excel Workbook

The vocabulary lists used in each course have been moved from the Test and Item Specifications to a separate Excel workbook. There are three worksheets in the vocabulary workbook.

1. MSP: First Used in Assessment Items
2. EOC: First Used in Exam Items
3. Not Used: Not used in assessment items

The Vocabulary workbook can be accessed through the following link: http://www.k12.wa.us/Mathematics/pubdocs/MathAssessmentVocabulary.xls.

Performance Level Descriptors

Performance Level Descriptors (PLDs) give teachers, parents/guardians and students more information about the typical skills and knowledge a student demonstrates on state assessments in each performance level. Committees of Washington state teachers, parents, community members and business representatives develop the Performance Level Descriptors during the standard setting process.

PLDs are broken down by the score levels students can earn:

- Basic (Level 2)
- Proficient (Level 3)
- Advanced (Level 4)

NOTE: There are no PLDs for Below Basic (Level 1).

PLDs for Grades 3 through 8 can be downloaded at http://www.k12.wa.us/assessment/StateTesting/PLD/default.aspx .

MSP Testing Windows

2012 Calendar for Paper-Pencil Testing

Paper/Pencil Schedule

Grades	Subjects	Requirement	2012 Paper/Pencil Testing Window	Schedule
3 & 6	Reading Mathematics	Required	April 25 to May 18	Locally Approved
4 & 7	Reading Writing Mathematics	Required	April 25 to May 18	Locally Approved
5 & 8	Reading Mathematics Science	Required	April 25 to May 18	Locally Approved

2012 Calendar for Online Testing:

Grades	Subjects	Requirement	2012 Online Testing Window	Schedule
3-8	Reading Mathematics	Required	April 25 to June 4	Locally Approved
7	Writing	Required	April 25 to June 4	Locally Approved
5 & 8	Science	Required	April 25 to June 4	Locally Approved

Online Testing

Online testing in Washington began in spring 2010 in grades 6-8 in reading and math. In spring 2011, reading and math were added in grades 4 and 5, and science in grades 5 and 8. In spring 2012, students in grade 3 will be able to take reading and math via computer.

Washington has joined a growing number of states that have moved to online testing. By spring 2012, it's expected a majority of students in grades 4-8 will take the MSP online instead of the traditional paper-and-pencil format.

A Student Demo for mathematics will be posted on the state's online-testing website early in 2012. The Student Demo allows students to view a demonstration of the testing software. The Demo can also be shared with parents and other interested community members.

A mathematics tutorial, known as the Online Testing Tools (OTT), will also be posted early in 2012. The OTT allows students to practice with the testing software, including navigating through the test and typing their responses to completion and short answer questions. The testing software must be loaded on the computer before using the OTT. Student responses are not saved or recorded.

Visit the online testing website for more information about online testing in Washington: http://www.k12.wa.us/assessment/StateTesting/OnlineTesting.aspx

Grades 6-8 Information

Mathematics Formula Sheet for Grades 6-8 MSP

The Mathematics Formula Sheet for Grades 6-8 MSP is located in the back of the Grades 6-8 Test and Item Specifications, which is located at http://www.k12.wa.us/Mathematics/TestItemSpec.aspx.

The Mathematics Formula Sheet is printed directly into all Grades 6-8 MSP test booklets and will be available to students during testing. The same Mathematics Formula Sheet is used for all three grade levels. This is to eliminate the need for students to become familiar with more than one formula sheet.

The Mathematics Formula Sheet is not secure and may be copied and distributed for classroom use. Teachers are encouraged to familiarize their students with this formula sheet prior to testing.

Calculator Use and Restrictions Policy

For grades 7-12 on the Measurements of Student Progress (MSP), End-of-Course (EOC) Assessments, and EOC Retake Assessments

A scientific calculator is sufficient for all items on all end-of-course (EOC) mathematics assessments and the Grade 7 and 8 Measurements of Student Progress (MSP). Students need access to the following calculator functions:

- Exponents
- Square root
- Cube root (for all EOC exams)
- Trigonometric functions (for Geometry/Integrated Mathematics 2 and Retake Year 2)

Please see the Calculator Use and Restrictions Policy for students in grades 7-12 taking the MSP, EOC exams, and EOC retake exams at http://www.k12.wa.us/Mathematics/CalculatorPolicy.aspx.

For more information, see additional calculator resources and a pre-recorded webinar explaining the calculator policy located in section 5 of the EOC Supports Moodle at http://moodle.ospi.k12.wa.us/course/view.php?id=18.

Students in grades 3-6 may not use a calculator on the MSP.

Manipulatives and Tools Allowed

on the Measurements of Student Progress (MSP), End-of-Course (EOC) Exams, and EOC Retake Exams

New content in the K-12 Mathematics Learning Standards has resulted in confusion about which manipulatives are allowed during the state assessments. Use of a variety of manipulatives by teachers during instruction can be beneficial for students to build concrete understanding of mathematical content and procedures. Students are also expected to understand the meaning of symbolic notation, develop fluency, and apply concepts and procedures in problem solving situations. Many performance expectations require students to demonstrate understanding at the symbolic notation, fluency, and application levels. Because of the need to assess these levels of understanding, some manipulatives used in the classroom are not appropriate for use on the state assessments. Of the utmost importance—**manipulatives should not provide answers to items.**

Manipulatives and Tools Allowed	Manipulatives and Tools Not Allowed

Manipulatives that are used during the assessment should not be distributed to the students but should be available in the classroom to students who elect to use them.
 	
• Straightedge (all grades)
• Ruler with centimeters and inches for grade 3 (required)
• Protractor or angle ruler for grade 5 (required)
• Compass for Year 2 EOC only
• Abacus for visually impaired/blind students using Braille edition
• Tiles, algebra tiles, cubes
• Base-ten pieces
• Pattern blocks, geoboards, Cuisenaire rods
• Judy clocks without a digital display
• Glossary of Non-Mathematics Terms
• Graph paper for grades 3-8 only (must be collected and shredded)
Tools that can remain on teachers' walls:
  • Hundreds charts (0-99 or 1-100 only)
  • Number lines with whole numbers only
	Because of the multitude and variety of materials available, the following list of materials that are not allowed is not exhaustive. Consider all manipulatives "Not Allowed" if they are not listed as "Allowed".
	
	The following list addresses the most commonly asked questions concerning manipulative use from the field.
	
	• Calculators for grades 3-6
	• Multiplication or addition matrices
	• Number lines with integers, fractions, decimals, or markings of multiples, prime, and/or composite numbers
	• Commercially- or student-made fraction pieces, fraction templates, or fraction materials, whether labeled or unlabeled
	• Dictionaries or thesauruses
	• Patty paper or tracing paper
	• Dry erase boards
	• Highlighters

If you have further questions regarding manipulatives contact: Assessment@k12.wa.us.

Common Core State Standards Updates

Washington formally adopted the Common Core State Standards (CCSS) July 20, 2011. These standards describe the knowledge and skills in English language arts and mathematics that young people will need upon graduation from high school, whatever their choice of college or career. More than 40 states have now adopted these standards.

OSPI and its partners will oversee a four-phase implementation strategy that begins in 2011-12 with developing awareness of what the standards are and how they differ from existing standards, and will conclude in 2014-15 with implementation of a new assessment system to measure student achievement of the standards. The goal for September 2014 is 100% of English language arts and mathematics teachers are prepared to teach Washington's new Common Core standards.

For more information regarding implementation of Common Core State Standards in Washington State, please see http://www.k12.wa.us/corestandards/ or http://www.k12.wa.us/Communications/PressReleases2011/CommomCore.aspx.

Resources

2011 Lessons Learned from Scoring Student Work

Each year, the Mathematics Assessment Team shares observations about student responses for the Measurements of Student Progress and the End-of-Course Exams and publishes these observations in *Lessons Learned from Scoring Student Work*. The purpose of this document is to provide teachers with insight into common misconceptions and errors that may keep students from earning full credit on state assessment items.

2011 Lessons Learned from Scoring Student Work can be downloaded in November 2011 at http://www.k12.wa.us/Mathematics/LessonsLearned.aspx.

Online Supports

The Mathematics Team has created support Moodle sites to provide a forum for teachers to collaborate and share with other teachers across the state. Each support Moodle sites contain links to OSPI resources, a database of teacher-created resources, and discussion forums.

MSP Supports Moodle:
http://moodle.ospi.k12.wa.us/course/view.php?id=28

Teacher Tool

The Teacher Tool gives diagnostic information about items on the MSP. A brief description of each item on the MSP is provided as well as state-level performance data.

The Teacher Tool can be accessed at the end of October and is located at http://www.k12.wa.us/TeacherResourceTool2010-11/default.aspx.

Sample Items for Classroom Use

The need to build a robust item bank with items that assess the new mathematics standards prevents the release of actual test items that have been used operationally for the current mathematics standards. In this document you will find new sample items available for classroom use as well as information and links to sample items released in other documents. Items on the MSP will consist of multiple-choice, completion, and short-answer items.

Item Types on the MSP

	Multiple-Choice	Completion	Short-Answer
Point Value	**1**	**1**	**2**
Distinguishing Feature(s)	• Each Multiple-Choice item has four answer choices, the correct answer and three distractors.	• Each Completion item requires the student to enter a numerical answer.	• Each Short-Answer item requires a constructed response. • A Short-Answer item may ask the student to write a sentence or equation; complete a table, graph, or chart; draw a picture; construct a diagram; or perform a calculation. • An Enhanced Multiple-Choice item will ask the student to select from a list of four answer choices and then show work to either explain the reason(s) for choosing that answer or to solve a problem.

New Samples for 2012

These items are samples that are aligned with the K-12 Mathematics Learning Standards. They have not gone through the comprehensive review process that test items must pass before placement on an actual state test. Teachers may still use these items as classroom exercises, or informal checks for understanding, as teachers have the ability and choice to clarify any questions about these items as students are working on them.

Please see the MSP Item Writing materials posted on the MSP Supports Moodle for more information.

Grade 6

Multiple-Choice Items

Sample item for Performance Expectation 6.1.H

Brian has two large bags of granola. One bag has $2\frac{1}{4}$ cups of granola and the other has $1\frac{1}{2}$ cups of granola. Brian wants to put the granola into small bags that each have $\frac{1}{4}$ cups of granola.

How many small bags of granola can Brian fill with all the granola in the two large bags?

- ○ **A.** 6 small bags
- ○ **B.** 12 small bags
- ○ **C.** 15 small bags
- ○ **D.** 43 small bags

Answer: C

Sample item for Performance Expectation 6.2.A

Look at the table.

V	2	4	6	8	10
P	5	10	15	20	25

Which equation shows the relationship between V and P ?

- **A.** $2V = 5P$
- **B.** $V + 3 = P$
- **C.** $25V = 10P$
- **D.** $V + 15 = P$

Answer: C

Sample item for Performance Expectation 6.3.F

Marianne collects snail shells. One morning, she collected 3 brown snail shells and 17 black snail shells. After lunch, she will collect more snail shells.

Based on the shells Marianne collected in the morning, what is the probability that the first shell she collects after lunch will be brown?

- **A.** 3%
- **B.** 15%
- **C.** 17%
- **D.** 50%

Answer: B

Sample item for Performance Expectation 6.3.G

Julien has a bag of markers. In the bag there are 7 red markers, 4 blue markers, 3 green markers, and 1 purple marker. Without looking, Julien reaches into the bag and pulls one marker.

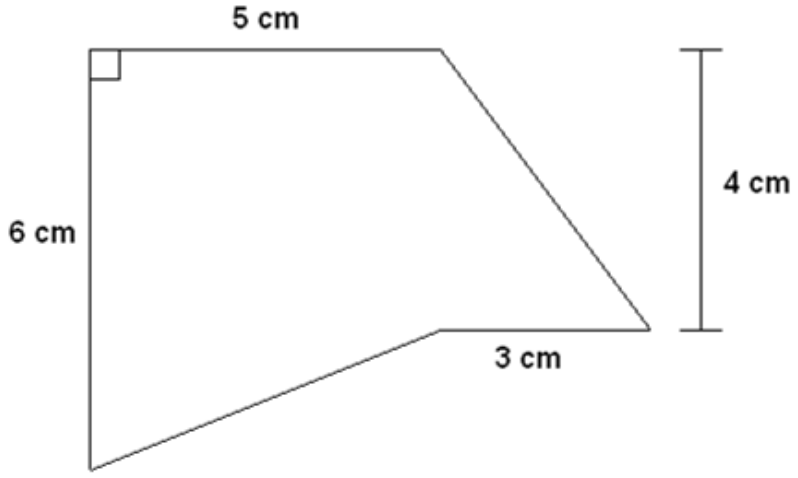
What is the probability that the marker Julien pulls is green?

- **A.** 3.0
- **B.** 2.0
- **C.** 0.3
- **D.** 0.2

Answer: D

Sample item for Performance Expectation 6.4.B

The figure is made of a rectangle and two right triangles. The dimensions are given in centimeters (cm).



What is the area of the figure?

- **A.** 18 square centimeters
- **B.** 31 square centimeters
- **C.** 62 square centimeters
- **D.** 360 square centimeters

Answer: B

Sample item for Performance Expectation 6.4.C

Kevin is using chalk to draw a large circle on the school playground. The circumference of the circle is approximately 44 feet.

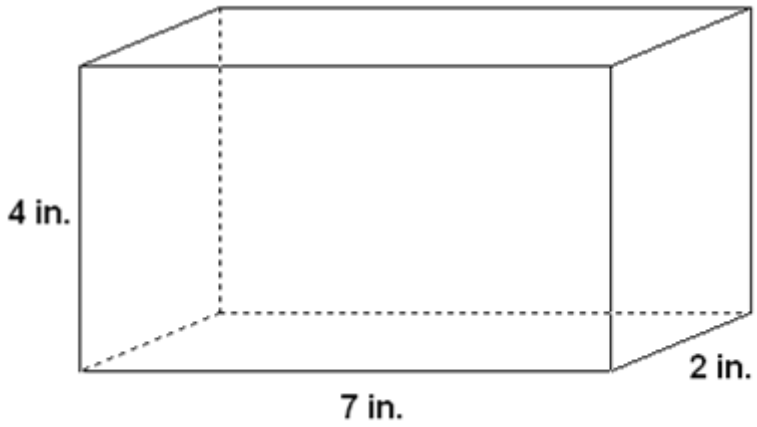
What is the approximate area of the circle?

- **A.** 154 square feet
- **B.** 308 square feet
- **C.** 616 square feet
- **D.** 1,078 square feet

Answer: A

Sample item for Performance Expectation 6.4.E

A rectangular prism has dimensions in inches (in.).



What is the surface area of the prism?

- **A.** 13 square inches
- **B.** 50 square inches
- **C.** 56 square inches
- **D.** 100 square inches

Answer: D

Sample item for Performance Expectation 6.4.F

Milos is building a pyramid for his younger sister. He will build the pyramid from cardboard and then wrap the entire pyramid in tin foil.

The square base of the pyramid has an edge length of 7 inches. Each of the triangular faces of the pyramid are congruent and have a height of 8 inches. Milos wants to know how many square inches of tin foil he will need to wrap the entire pyramid.

What is the surface area of the pyramid?

- **A.** 56 square inches
- **B.** 77 square inches
- **C.** 161 square inches
- **D.** 273 square inches

Answer: C

Completion Items

Sample item for Performance Expectation 6.2.C

Determine the value of the expression $12g + 7h$ when $g = \frac{2}{3}$ and $h = \frac{3}{7}$.

Write your answer on the line.

What is the value of the expression $12g + 7h$? _____

Answer: 11

Sample item for Performance Expectation 6.2.C

Evaluate the expression. Let $d = 2$.

$$\frac{3 + 2d}{14}$$

Write your answer on the line.

What is the value of the expression? _____

Answer: $\frac{7}{14}$ **or equivalent.**

Sample item for Performance Expectation 6.3.F

Orien's favorite color is yellow. One day, he makes a tally chart of the yellow cars that drive by the apartment he lives in.

Cars Driving By

Yellow Cars	
Non-Yellow Cars	

Based on the data in the table, determine the experimental probability that the next car that drives by the apartment is yellow.

Write your answer on the line.

What is the experimental probability that the next car that drives by the apartment is yellow? _____

Answer: $\frac{8}{28}$ **or equivalent**

Sample item for Performance Expectation 6.3.G

At a pet store, there are 14 parakeet birds in a display. Of all the parakeets, 3 are male. A worker at the pet store takes one parakeet at random out of the display for a customer.

Determine the probability the parakeet is a male parakeet.

Write your answer on the line.

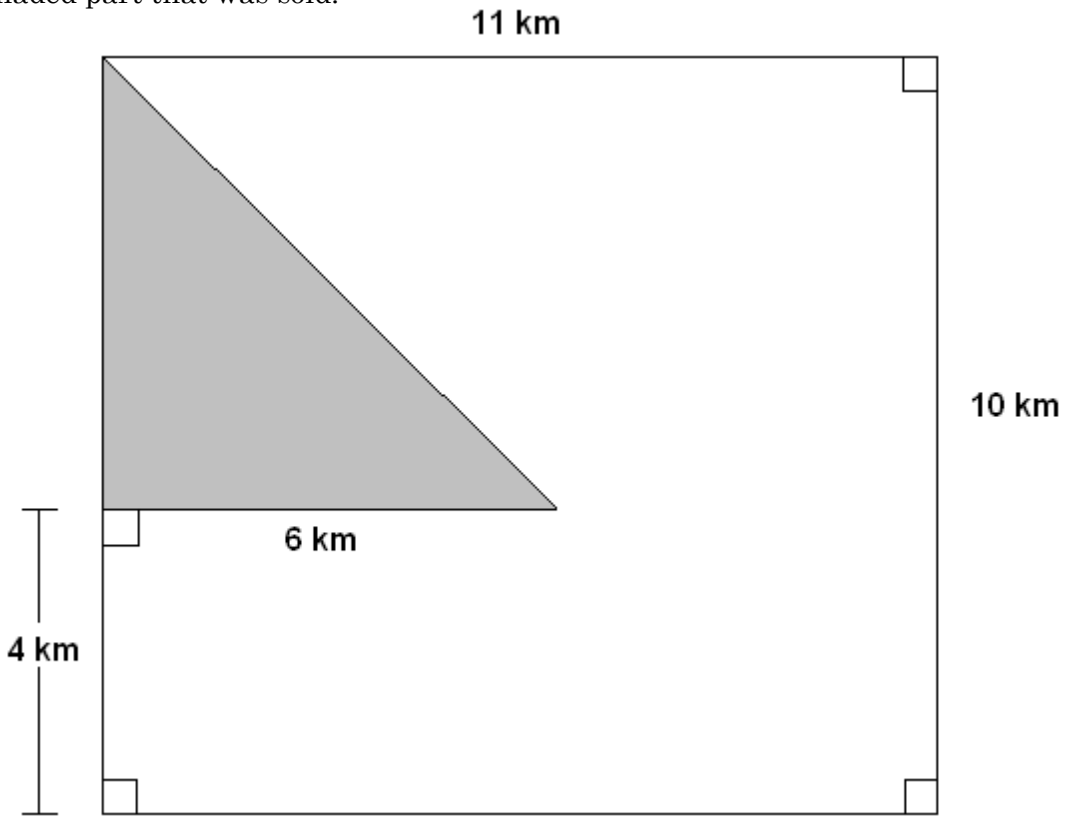
What is the probability that the parakeet is a male parakeet?

_____

Answer: $\frac{3}{14}$ **or equivalent**

Sample item for Performance Expectation 6.4.B

A triangular part of a rectangular piece of land was sold. The original piece of land has dimensions of 11 kilometers by 10 kilometers. The picture shows the original land and the gray-shaded part that was sold.



Determine the area of land left after the gray-shaded triangular part of land was sold.

Write your answer on the line.

What is the area of land left after the gray-shaded triangular part of land was sold? _____ square kilometers

Answer: 92

Sample item for Performance Expectation 6.4.E

A rectangular prism has a height of 2.5 inches, a width of 4 inches, and a length of 8 inches.

Determine the surface area of the prism.

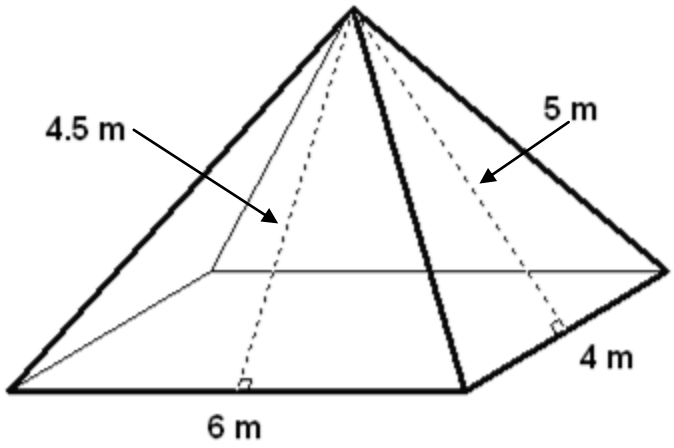
Write your answer on the line.

What is the surface area of the prism? _____ square inches

Answer: 124

Sample item for Performance Expectation 6.4.F

A rectangular pyramid has two triangular faces with a length of 6 meters and a height of 4.5 meters and two triangular faces with a length of 4 meters and a height of 5 meters, as shown in the figure.



Determine the surface area of the pyramid.

Write your answer on the line.

What is the surface area of the pyramid? _____ square meters

Answer: 71

Short-Answer Items

Sample item for Performance Expectation 6.1.H

Jezel has an old ribbon that she wants to use for an art project. The old ribbon is $2\frac{2}{3}$ yards long. Jezel will cut $\frac{1}{12}$ of a yard off each end of the ribbon and then cut the remaining ribbon into $\frac{1}{4}$-yard long pieces.

Determine how many $\frac{1}{4}$-yard long pieces of ribbon Jezel will have.

Show your work using words and/or numbers.

How many $\frac{1}{4}$-yard long pieces of ribbon will Jezel have?

_____ pieces

2-point response: The student shows understanding of solving a word problem by doing the following:

Understanding:

- uses $2\frac{2}{3}$, $\frac{1}{12}$, and $\frac{1}{4}$

Procedure:

- shows a procedure involving operations with fractions to determine the number of pieces of ribbon

Answers:

- writes 10.

Students can earn 1 point by doing one of the following:

- uses $2\frac{2}{3}$, $\frac{1}{12}$, and $\frac{1}{4}$ and shows a procedure involving operations with fractions that could lead to the number of pieces of ribbon
- writes 10.

Sample item for Performance Expectation 6.2.A

Jerome is making folded paper cranes. In 1 hour he made 17 folded paper cranes. He knows it takes the same amount of time to make each folded paper crane.

- Write an equation with one variable that Jerome could use to determine how much time it takes to make each folded paper crane.
- Be sure to define the variable.

Do not solve the equation.

Equation: _____ **Define the Variable:**

2-point response: The student shows understanding of writing an equation with variables to represent information in a given situation by doing one of the following:

- writes 1 = 17*t*, or equivalent and defines *t* as time, in hours, to make 1 folded paper crane, or equivalent
- writes 60 = 17*t*, or equivalent and defines *t* as time, in minutes, to make 1 folded paper crane, or equivalent
- writes 3600 = 17*t*, or equivalent and defines *t* as time, in seconds, to make 1 folded paper crane, or equivalent

Students can earn 1 point by doing one of the following:

- writes 1 = 17*t*, or equivalent
- writes 60 = 17*t*, or equivalent
- writes 3600 = 17*t*, or equivalent
- defines *t* as time, in seconds, minutes, or hours, to make 1 folded paper crane, or equivalent.

NOTE: Any letter may be used for the variable.

Sample item for Performance Expectation 6.2.A

Gina feeds and waters horses every day after school. Part of watering the horses is completing a table to show how much water is in the trough. This is the table Gina made last week.

Water in Trough

Day	1	2	3	4	5	6	7
Water in the Trough (gallons)	12	$10\frac{1}{2}$	9	$7\frac{1}{2}$	6	$4\frac{1}{2}$	3

Gina knows she can write an equation to represent how many gallons of water were in the trough for any day last week.

Let d = the day of the week.
Let w = the number of gallons of water in the trough.

Write an equation using d and w that could be used to determine how many gallons of water were in the trough for any day last week.

Do not solve your equation.

Equation: _____

2-point response: The student shows understanding of writing an equation with variables to represent information in a table by writing $w = 13.5 – 1.5d$, or equivalent.
Students can earn 1 point by doing one of the following:

- writes $w = 12 – 1.5d$, or equivalent
- writes an equation that includes the expression $13.5 – 1.5d$, or equivalent

NOTE: If students use variables other than d and w, the variables must be defined.

Sample item for Performance Expectation 6.4.C

Danielle builds toy cars. She has several different sizes of tires. The largest tire has a circumference of 12.56 inches. The smallest tire has a radius that is $1\frac{1}{2}$ inches shorter than the radius of the largest tire.

Determine the radius of the smallest tire.

Show your work using words and/or numbers.

What is the radius of the smallest tire? _____ inches

2-point response: The student shows understanding of solving a word problem by doing the following:

Understanding:

- uses 12.56 and $1\frac{1}{2}$

Procedure:

- shows a procedure involving the relationships among radius and circumference to determine the radius of the smallest tire

Answers:

- writes $\frac{1}{2}$, or equivalent.

Students can earn 1 point by doing one of the following:

- uses 12.56 and $1\frac{1}{2}$ and shows a procedure involving the relationships among radius and circumference that could lead to the radius of the smallest tire
- writes $\frac{1}{2}$, or equivalent.

Grade 7

Multiple-Choice Items

Sample item for Performance Expectation 7.1.C

Look at the expression.

$$16\frac{2}{5} - 18.75$$

What is the value of the expression?

- **A.** -2.50
- **B.** -2.35
- **C.** 2.35
- **D.** 2.50

Answer: B

Sample item for Performance Expectation 7.1.C, 7.1.D

Determine the value of the expression.

$$-|4-13|+5$$

What is the value of the expression?

- **A.** 14
- **B.** 4
- **C.** -4
- **D.** -12

Answer: C

Sample item for Performance Expectation 7.2.B

Juro is studying butterfly larvae. He learns that for a particular type of butterfly, the length of the larva is proportional to its age. Juro measures the length of a 3-month-old larva and finds it has a length of 2.1 centimeters. He measures the length of another larva and finds it is 3.5 centimeters long.

How many months old is the larva that is 3.5 centimeters long?

- ○ **A.** 7 months
- ○ **B.** 6 months
- ○ **C.** 5 months
- ○ **D.** 4 months

Answer: C

Sample item for Performance Expectation 7.2.C

Doris drew two similar rectangles. The length of the larger rectangle is 32 centimeters, and the width of the larger rectangle is 11 centimeters. The length of the smaller rectangle is 10 centimeters.

Let w = the width of the smaller rectangle.

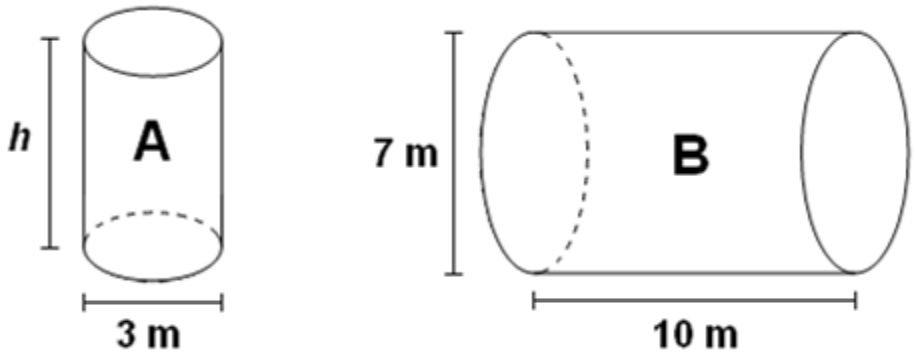
Which proportion could Doris use to determine the width of the smaller rectangle?

- ○ **A.** $\frac{32}{11} = \frac{10}{w}$
- ○ **B.** $\frac{11}{32} = \frac{10}{w}$
- ○ **C.** $\frac{w}{32} = \frac{10}{11}$
- ○ **D.** $\frac{w}{11} = \frac{32}{10}$

Answer: A

Sample item for Performance Expectation 7.2.C

Cylinder A and cylinder B are similar and have measurements shown in meters.



What is the height, h, of cylinder A?

- **A.** $\frac{21}{10}$ meters
- **B.** $\frac{10}{21}$ meters
- **C.** $\frac{30}{7}$ meters
- **D.** $\frac{7}{30}$ meters

Answer: C

Sample item for Performance Expectation 7.2.E

The table represents a proportional relationship.

D	7.5	11.25	15	18.75	22.5
R	3	4.5	6	7.5	9

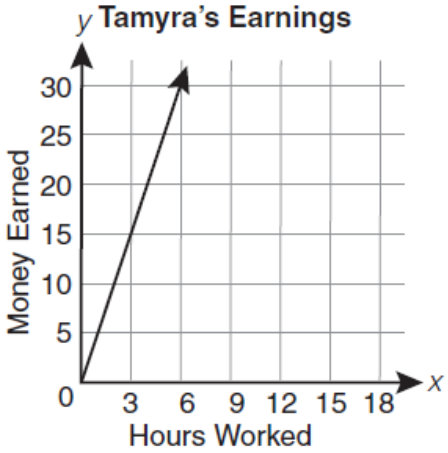
Which equation shows the relationship between D and R ?

- **A.** $7.5D = 3R$
- **B.** $D - 4.5 = R$
- **C.** $9D = 22.5R$
- **D.** $D - 13.5 = R$

Answer: C

Sample item for Performance Expectation 7.2.F

Tamyra earns money walking her neighbors' dogs. The graph shows the amount of money Tamyra earns based on the number of hours she walks the dogs.



What is the slope of the line in the graph?

○ **A.** $\frac{3}{15}$

○ **B.** $\frac{1}{3}$

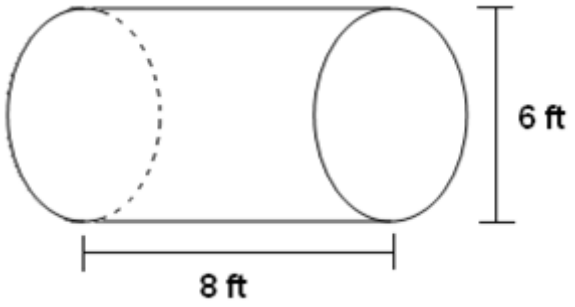
○ **C.** $\frac{3}{1}$

○ **D.** $\frac{15}{3}$

Answer: D

Sample item for Performance Expectation 7.3.A

The cylinder has dimensions shown in feet (ft).



What is the volume of the cylinder?

- **A.** 288π cubic feet
- **B.** 72π cubic feet
- **C.** 48π cubic feet
- **D.** 24π cubic feet

Answer: B

Sample item for Performance Expectation 7.3.B

A square pyramid has a base with an edge length of 2.5 inches. The height of the pyramid is 12 inches.

What is the volume of the pyramid?

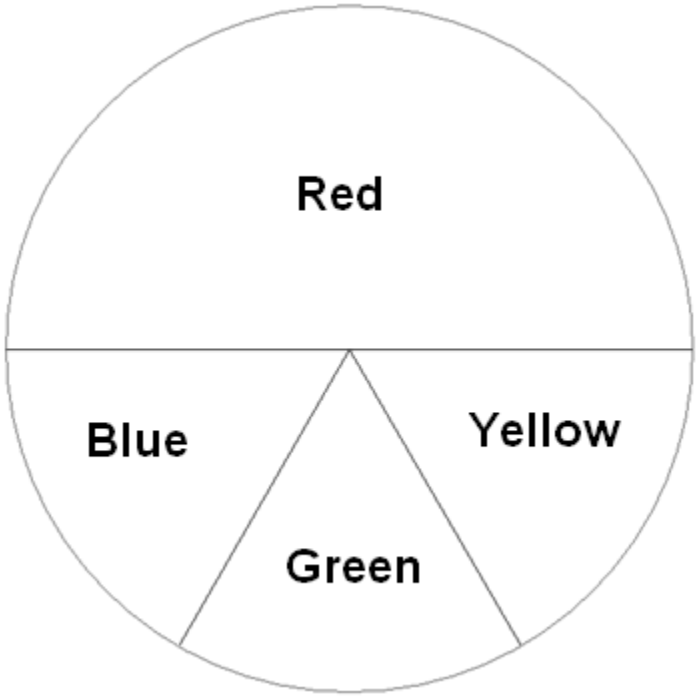
- **A.** 75 cubic inches
- **B.** 25 cubic inches
- **C.** 30 cubic inches
- **D.** 10 cubic inches

Answer: B

Sample item for Performance Expectation 7.4.B

Boseda is designing a board game. On their turns, players spin a spinner to determine if they will draw a red, blue, green, or yellow card. Boseda draws the spinner so that half the spinner is red and the other half is divided equally between blue, green, and yellow.

Boseda's Spinner



During a typical game, the spinner is spun 120 times.

Based on theoretical probability, how many times will the spinner stop in the "Red" region of the spinner when the spinner is spun 120 times?

- **A**. 20 times
- **B**. 30 times
- **C.** 40 times
- **D.** 60 times

Answer: D

Sample item for Performance Expectation 7.4.D

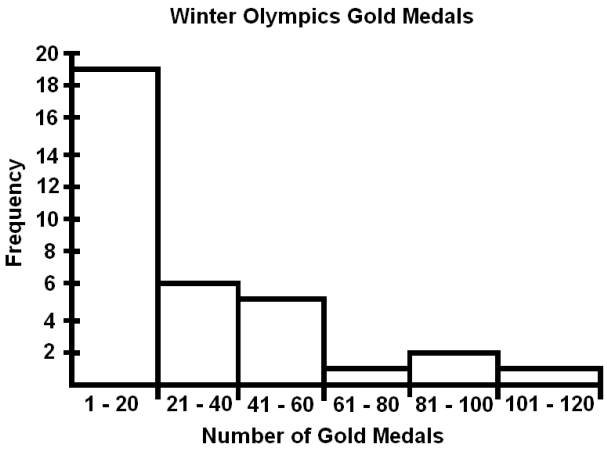
Cleo is studying the Winter Olympics. She wants to create a histogram to show the number of gold medals each country's athletes have won. She finds this list of the number of gold medals won at the Winter Olympics.

107, 89, 87, 78, 55, 52, 48, 44, 41, 39, 37, 36, 29, 27, 23,

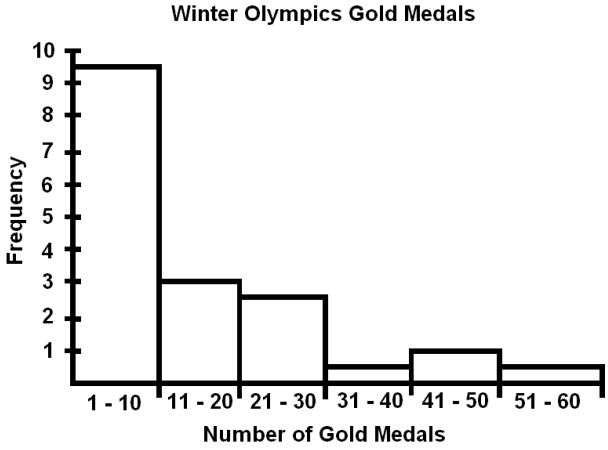
9, 9, 9, 9, 5, 5, 4, 4, 2, 2, 2, 1, 1, 1, 1, 1, 1, 1, 1

Which histogram correctly represents the number of gold medals each country's athletes have won at the Winter Olympics?

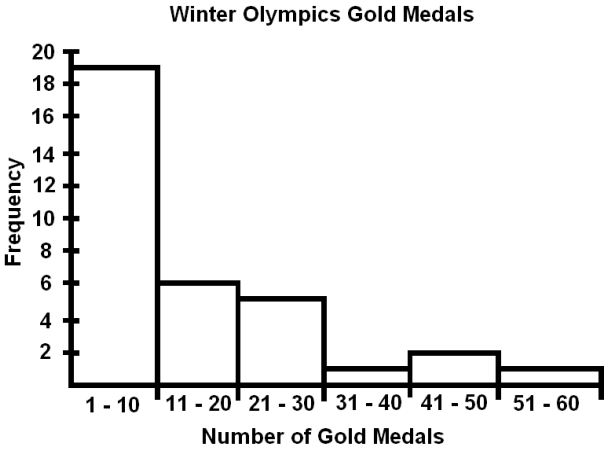
○ **A.**



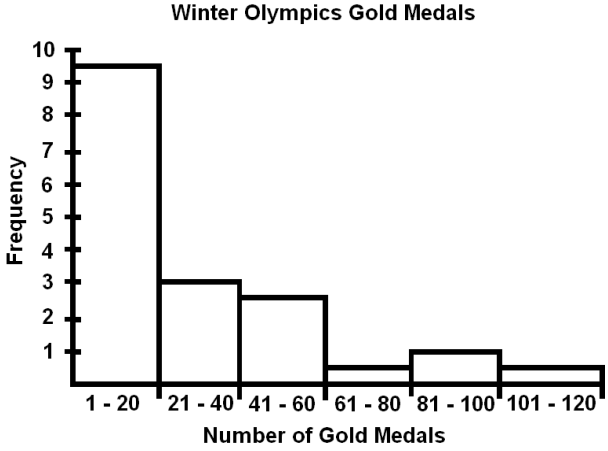
○ **C.**



○ **B.**



○ **D.**



Answer: A

Completion Items

Sample item for Performance Expectation 7.1.C

Determine the difference.

$$12.6 - 15\frac{1}{5}$$

Write your answer on the line.

What is the difference? _____

Answer: -2.6, -2 $\frac{3}{5}$, or equivalent

Sample item for Performance Expectation 7.1.C

Determine the value of the expression.

$$(-6 + 5\frac{1}{3}) \times 0.4$$

Write your answer on the line.

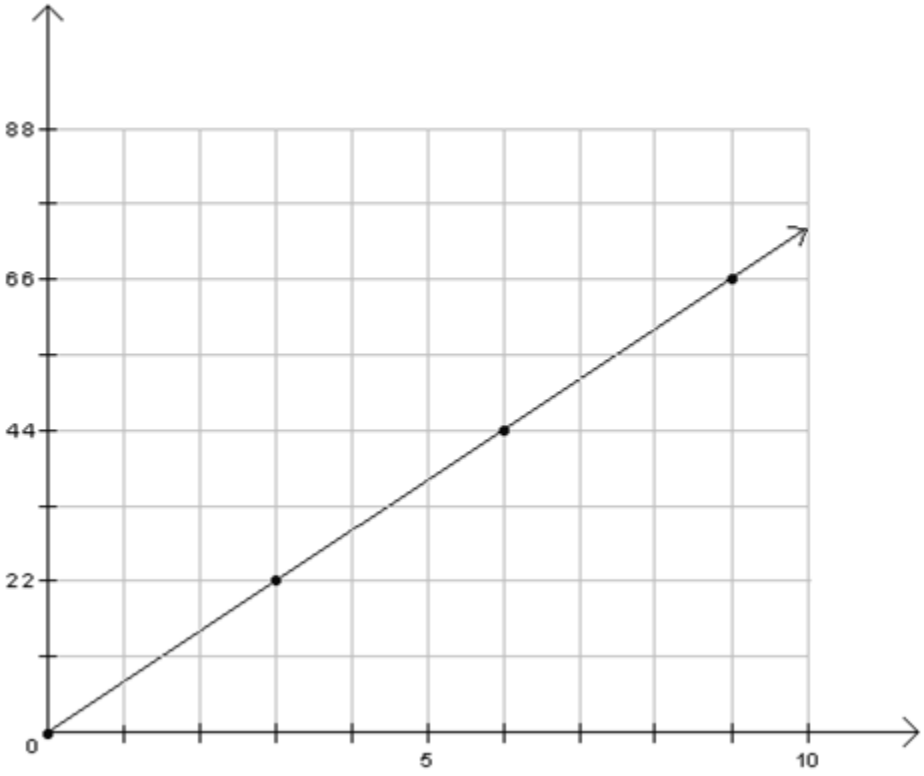
What is the value of the expression? _____

Answer: $-\frac{4}{15}$

Note: A decimal equivalence is $-0.2\overline{6}$; other decimal values are not the value of the expression and may not be accepted for credit.

Sample item for Performance Expectation 7.2.F

The graph represents a proportional relationship.



Determine the slope of the line.

Write your answer on the line.

What is the slope of the line? _____

Answer: $\frac{22}{3}$, or equivalent

Note: A decimal equivalence is $7.\overline{3}$; other decimal values are not the slope of the line and may not be accepted for credit.

Sample item for Performance Expectation 7.3.A

A cylinder has a height of 5 inches. The diameter of the base is 20 inches.

Determine the surface area of the cylinder to the nearest square inch.

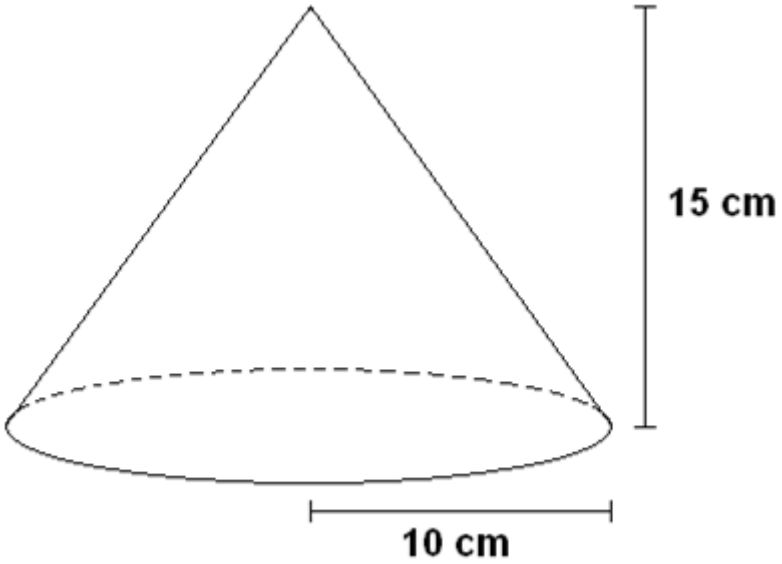
Write your answer on the line.

What is the surface area of the cylinder? _____ square inches

Answer: 942 or 943 or 300π

Sample item for Performance Expectation 7.3.B

The cone has measurements shown in centimeters (cm).



Determine the volume of the cone to the nearest cubic centimeter.

Write your answer on the line.

What is the volume of the cone? _____ cubic centimeters

Answer: 1,570 or 1,571 or 500π

Sample item for Performance Expectation 7.4.B

Every morning, the bus that takes Ferdinand to school drives along Main Street, crosses First Avenue, and then turns left on Second Avenue. There is a stoplight where Main Street crosses First Avenue. Sometimes the stoplight is red, sometimes it is yellow, and sometimes it is green. The theoretical probability that the stoplight is green is 45%. The bus goes to school 180 days in one year.

Determine the number of days out of 180 days the stoplight will be green.

Write your answer on the line.

How many days out of 180 days will the stoplight be green? _____ days

Answer: 81

Short-Answer Items

Sample item for Performance Expectation 7.1.F

Theresa is making a clay vase in art class. Theresa's art teacher tells her that Theresa should use 4 ounces of clay to start the vase and use an additional 2 ounces of clay per quart of water she wants to put in the vase.

- Write an equation using two variables to represent the number of ounces of clay Theresa would use to make a clay vase for any number of quarts of water she wants to put in the vase.
- Be sure to define the variables you use.

Do not solve the equation.

Equation: _____ **Define the Variables:**

2-point response: The student shows understanding of writing an equation that corresponds to a given problem situation by doing the following:

- writes $c = 2q + 4$, or equivalent
- defines c as ounces of clay
- defines q as number of quarts of water.

Students can earn 1 point by doing one of the following:

- writes $c = 2q + 4$, or equivalent
- defines c as ounces of clay and q as number of quarts of water.

NOTE: Any letter may be used for the variable.

Sample item for Performance Expectation 7.2.B

Lulu is studying two moons of Jupiter, Ganymede and Io. She learns that for every 1 time Ganymede orbits Jupiter, Io orbits Jupiter 4 times. She also learns that Ganymede orbits Jupiter approximately 51.5 times in one year.

Determine how many times Io orbits Jupiter in one year.

Show your work using words and/or numbers.

How many times does Io orbit Jupiter in one year? _____ times

2-point response: The student shows understanding of solving a word problem by doing the following:

Understanding:

- uses 1, 4, and 51.5

Procedure:

- shows a procedure involving proportional relationships to determine the number of times Io orbits Jupiter in one year

Answers:

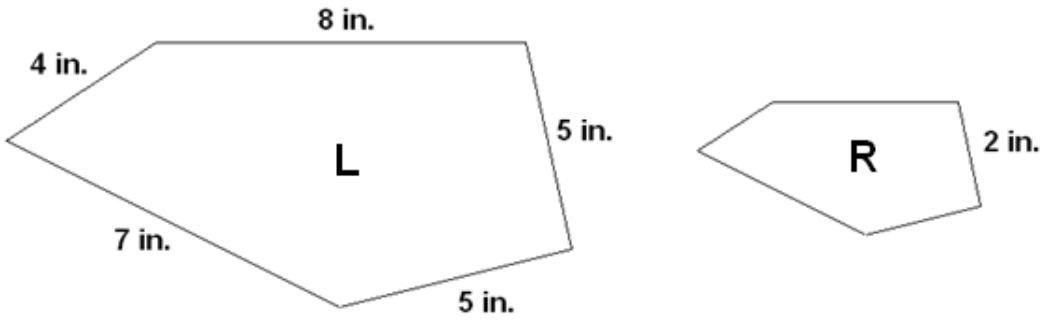
- writes 206.

Students can earn 1 point by doing one of the following:

- uses 1, 4, and 51.5 and shows a procedure involving proportional relationships that could lead to the number of times Io orbits Jupiter in one year
- writes 206.

Sample item for Performance Expectation 7.2.C

Pentagon L and pentagon R are similar.



Let p = the perimeter of pentagon R.

Which proportion could be used to determine the perimeter of pentagon R?

○ **A.** $\frac{29}{5} = \frac{2}{p}$

○ **B.** $\frac{2}{29} = \frac{5}{p}$

○ **C.** $\frac{p}{5} = \frac{29}{2}$

○ **D.** $\frac{p}{29} = \frac{2}{5}$

Solve the proportion to determine the perimeter of pentagon R.

Show the steps you used to solve the proportion.

What is the perimeter of pentagon R ? _____ **inches**

2-point response: The student shows understanding of describing proportional relationships in similar figures and solving problems involving similar figures by doing the following:

- chooses D
- shows a procedure involving solving a proportion to determine the perimeter of pentagon R
- writes 11.6, or equivalent.

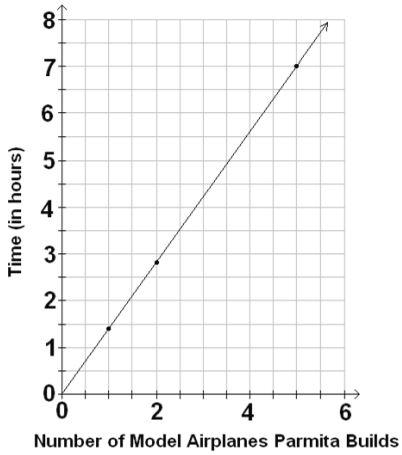
Students can earn 1 point by doing one of the following:

- chooses D
- shows a procedure involving solving a proportion that could lead to determining the perimeter of pentagon R
- chooses A, B, or C, shows a procedure to solve the proportion, and writes an answer consistent with the proportion they chose
- writes 11.6, or equivalent.

Sample item for Performance Expectation 7.2.E

Parmita builds model airplanes. The time it takes her to build different numbers of model airplanes is represented in the graph and table.

Building Model Airplanes



Building Model Airplanes

Number of Model Airplanes Parmita Builds	3	5	7
Time (in hours)	4.2	7	9.8

Let n = the number of model airplanes Parmita builds.
Let t = time, in hours.

- Write an equation to represent the information in the graph and table.

Equation: _____

- Describe how you used the information in the graph and/or table to write your equation.

Be sure to use specific numbers from the graph and/or table in your explanation.

2-point response: The student shows understanding of representing proportional relationships using equations and making connections among the representations by doing the following:

- writes $t = 1.4n$, or equivalent
- uses specific numbers from the graph and/or table to describe how the equation was determined.

Students can earn 1 point by doing one of the following:

- writes $t = 1.4n$, or equivalent
- uses specific numbers from the graph and/or table to describe how the equation was determined.

NOTE: If students use variables other than *t* and/or *n*, the variables must be defined.

Sample item for Performance Expectation 7.3.D

Raul wants to feed oats to his uncle's horses. Raul will use a cylindrical coffee can to feed the horses. The coffee can has a height of 6 inches, and the base of the coffee can has a diameter of 3 inches. Raul's uncle tells Raul that the horses should get a maximum of 2 quarts of oats each day.

2 quarts ≈ 134.4 cubic inches

Determine the greatest number of full coffee cans of oats Raul can give the horses each day.

Show your work using words and/or numbers.

What is the greatest number of full coffee cans of oats Raul can give the horses each day? _____ full coffee cans of oats

2-point response: The student shows understanding of solving a word problem by doing the following:

Understanding:

- uses 6, 3, and 134.4

Procedure:

- shows a procedure involving volume to determine the greatest number of full coffee cans of oats

Answers:

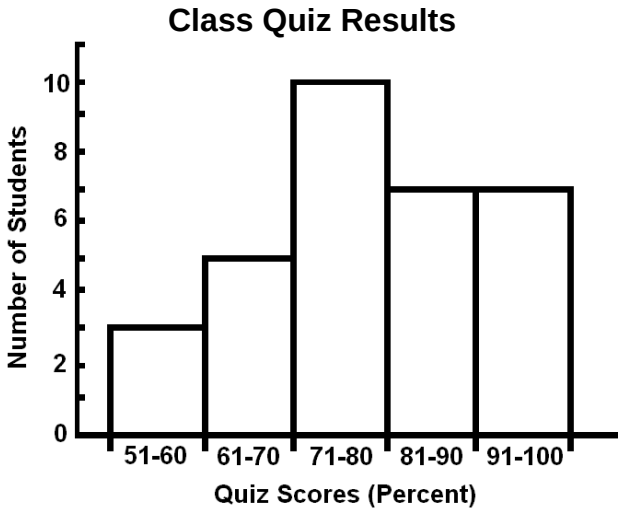
- writes 3.

Students can earn 1 point by doing one of the following:

- uses 6, 3, and 134.4 and shows a procedure involving volume that could lead to the greatest number of full coffee cans of oats
- writes 3.

Sample item for Performance Expectation 7.4.D

Javier's teacher created a histogram of the students' quiz scores. The histogram shows the quiz scores for all 32 students in the class.



Javier scored 81% on the quiz. He wants to know what percent of students scored 81% or higher on the quiz.

Determine the percent of students that scored 81% or higher on the quiz.

Show your work using words and/or numbers.

What percent of students scored 81% or higher on the quiz? _____ % (percent)

2-point response: The student shows understanding of interpreting a histogram by doing the following:

- shows work to determine the percent of students that scored 81% or higher on the quiz
- writes a number in the interval 43.75 – 44, inclusive.

Students can earn 1 point by doing one of the following:

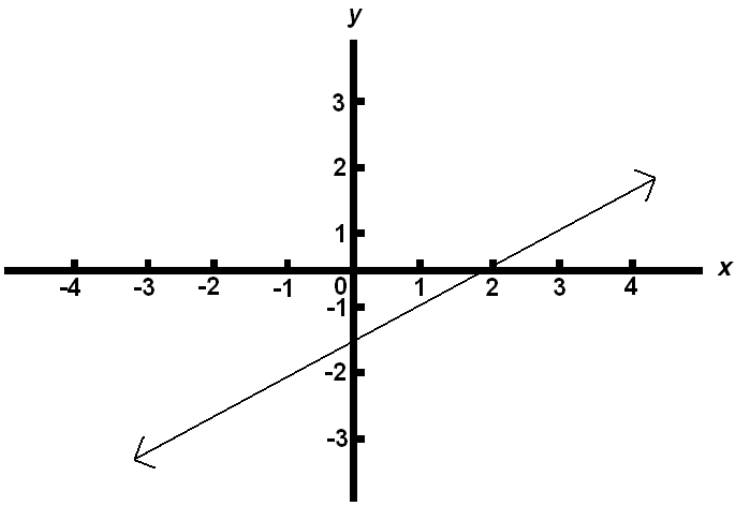
- shows work that could lead to determining the percent of students that scored 81% or higher on the quiz
- writes a number in the interval 43.75 – 44, inclusive.

Grade 8

Multiple-Choice Items

Sample item for Performance Expectation 8.1.C

The graph represents a linear function.



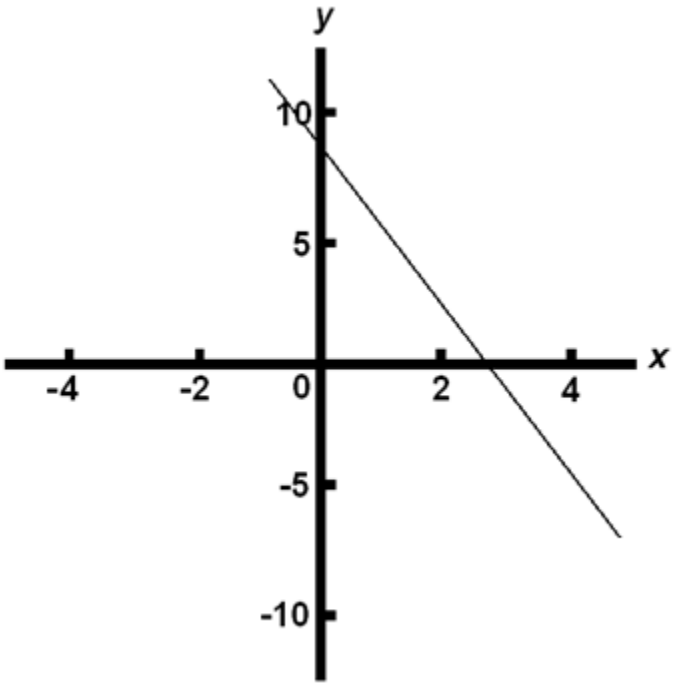
Which statement describes the graph of the linear function?

- ○ **A.** The *x*-intercept of the line is negative.
- ○ **B.** The *y*-intercept of the line is positive.
- ○ **C.** The slope of the line is negative.
- ○ **D.** The slope of the line is positive.

Answer: D

Sample item for Performance Expectation 8.1.E

The graph shows the temperature for one night in February. In the graph, *x* is the time in hours from 6 P.M. and *y* is the temperature in degrees Fahrenheit.



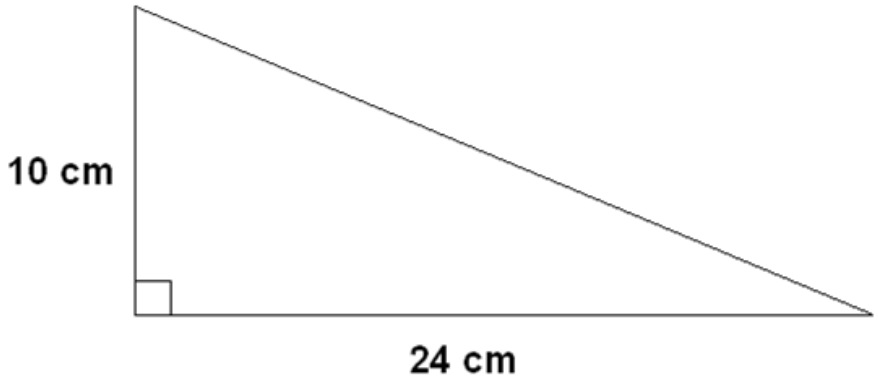
What does the slope of the line represent?

- **A.** The temperature at 6 P.M..
- **B.** The temperature each hour.
- **C.** The number of degrees the temperature dropped each hour.
- **D.** The number of degrees the temperature dropped since 6 P.M..

Answer: C

Sample item for Performance Expectation 8.2.F

Drew cut a piece of glass into the shape of a right triangle. The measurements of two sides of the triangle are given in centimeters (cm).



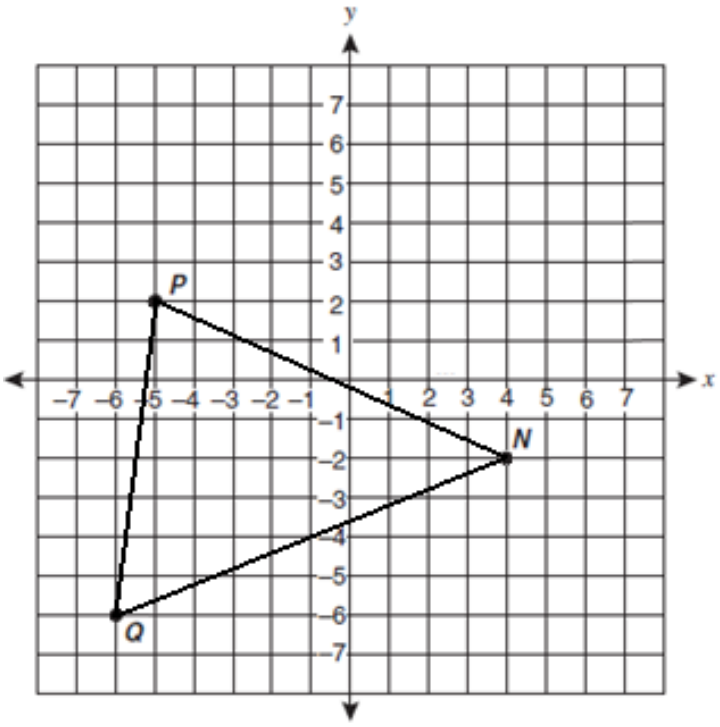
Which expression represents the length of the third side of the triangle?

- **A.** $\sqrt{10^2 + 24^2}$
- **B.** $10^2 + 24^2$
- **C.** $\sqrt{10 + 24}$
- **D.** $10 + 24$

Answer: A

Sample item for Performance Expectation 8.2.G

Triangle PNQ is drawn on a coordinate plane.



What is the length of line segment PN to the nearest unit?

- ○ **A.** 13 units
- ○ **B.** 10 units
- ○ **C.** 9 units
- ○ **D.** 4 units

Answer: B

Sample item for Performance Expectation 8.3.F

The letter "e" is the most commonly used letter in the English language. In a list of 12 words, the letter "e" appears in 8 of the words. Two different words from the list are randomly chosen.

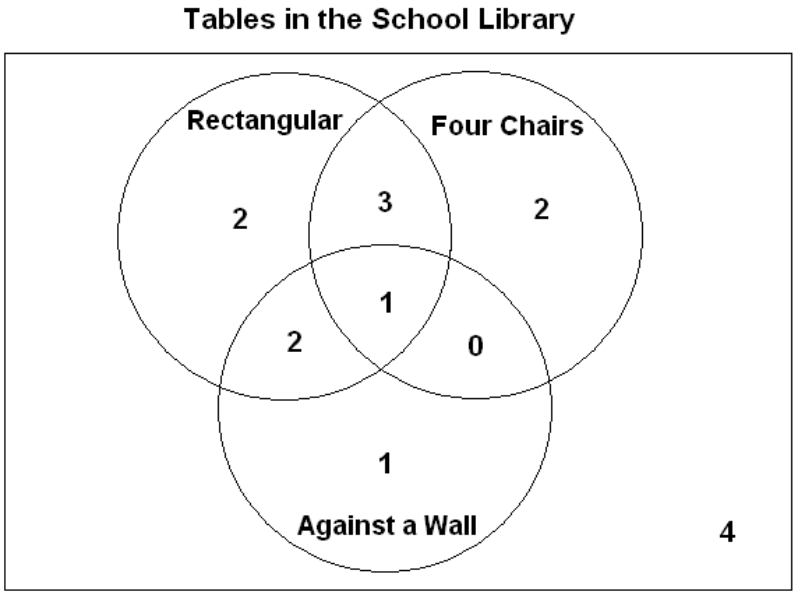
What is the probability that the letter "e" appears in both words?

- ○ **A.** $\frac{2}{3}$
- ○ **B.** $\frac{1}{3}$
- ○ **C.** $\frac{14}{33}$
- ○ **D.** $\frac{7}{18}$

Answer: C

Sample item for Performance Expectation 8.3.G

In the school library there are several tables. The Venn diagram shows how many tables are rectangular, how many tables have four chairs, and how many tables are pushed against a wall.



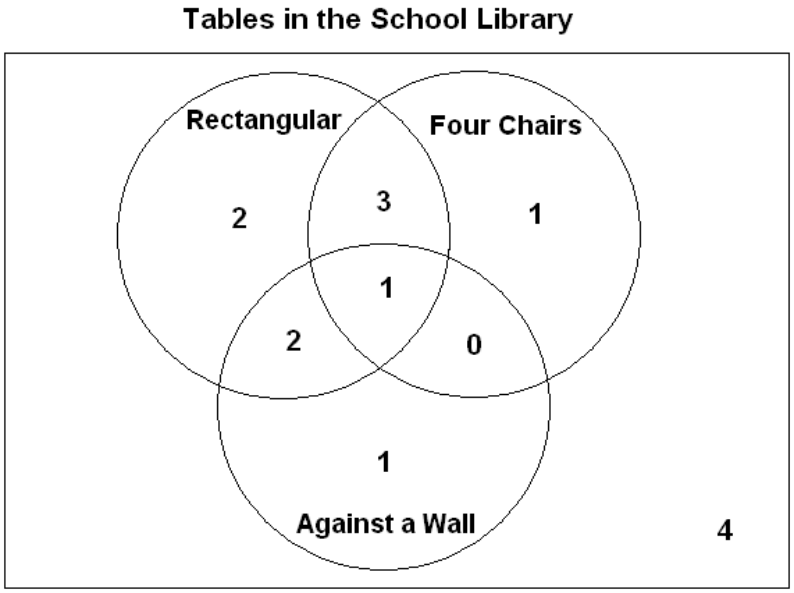
How many tables in the school library have four chairs?

- **A.** 8 tables
- **B.** 6 tables
- **C.** 4 tables
- **D.** 2 tables

Answer: B

Sample item for Performance Expectation 8.3.G

In the school library there are several tables. The Venn diagram shows how many tables are rectangular, how many tables have four chairs, and how many tables are pushed against a wall.



How many tables in the school library are rectangular and have four chairs?

- **A.** 1 tables
- **B.** 2 tables
- **C.** 3 tables
- **D.** 4 tables

Answer: D

Sample item for Performance Expectation 8.4.A

The second nearest star to Earth is approximately 39,700,000,000,000 kilometers away.

What is 39,700,000,000,000 written in scientific notation?

- **A.** 3.97×10^{11}
- **B.** 3.97×10^{12}
- **C.** 3.97×10^{13}
- **D.** 3.97×10^{14}

Answer: C

Completion Items

Sample item for Performance Expectation 8.1.A

Look at the equation.

$$\frac{r}{6} + \frac{2}{3} = 9$$

Determine the value of r in the equation.

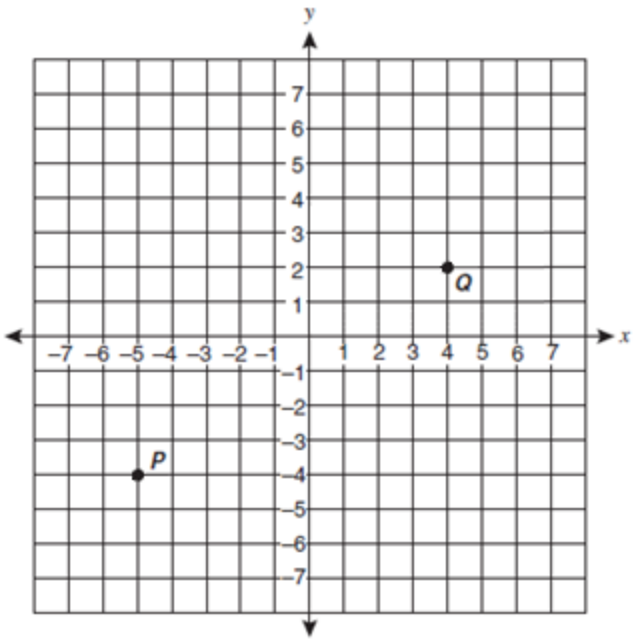
Write your answer on the line.

What is the value of *r* in the equation? _____

Answer: 50

Sample item for Performance Expectation 8.2.G

Point P and point Q are graphed on the coordinate grid.



Determine the distance between point P and point Q to the nearest unit.

Write your answer on the line.

What is the distance between point P and point Q ? _____ units

Answer: 11, $\sqrt{117}$

Sample item for Performance Expectation 8.3.F

Employees at a local grocery store drive to work every day. There are 5 employees but only 3 spots in the parking lot for employees. Each day, 2 employees park on the street. Each employee has the same chance of parking in one of the spots in the parking lot.

Determine the probability that the same employee will park in the parking lot two days in a row.

Write your answer on the line.

What is the probability that the same employee will park in the parking lot two days in a row? _____

Answer: 0.36, 36%, $\frac{9}{25}$, or equivalent

Sample item for Performance Expectation 8.4.C

Determine the value of the expression.

$$\frac{4^3 \times 4^9}{4^8}$$

Write your answer on the line.

What is the value of the expression? _____

Answer: 256

Short-Answer Items

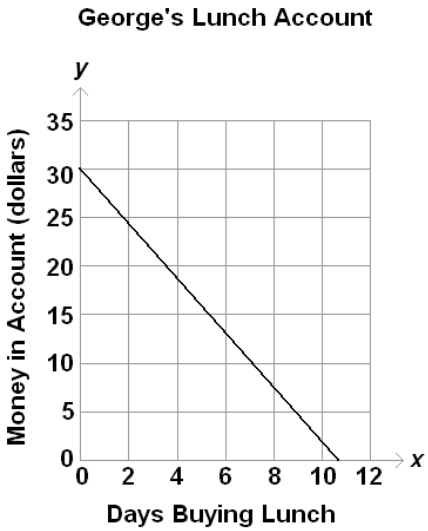
Sample item for Performance Expectation 8.1.C

George sometimes buys lunch at school. He has money in an account that is used to pay for the cost of each lunch. The equation and the graph represent the amount of money in George's account based on the number of days he buys lunch.

Let x = the number of days he buys lunch.
Let y = the amount of money in dollars in George's account.

George's Lunch Account

$y = 30 - 2.75x$



Write a verbal description of the amount of money in George's account based on the number of days he buys lunch.

Be sure to use specific numbers from the equation and/or graph in your description.

2-point response: The student shows understanding of representing a linear function with a verbal description and making connections among representations by doing the following:

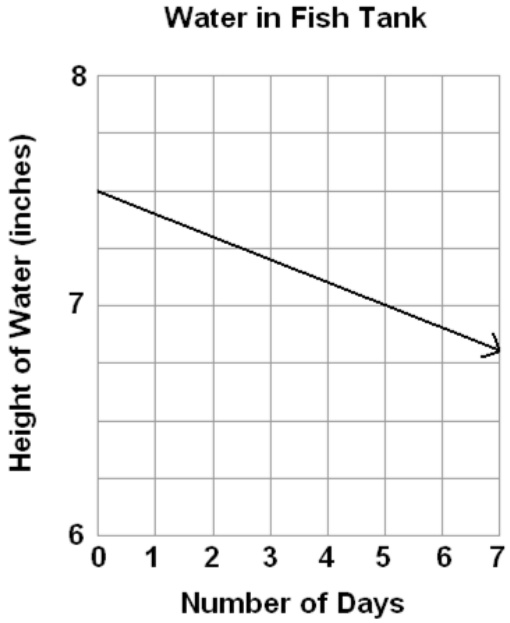
- writes a verbal description of the amount of money in the lunch account based on the number of days lunch is bought
- uses specific numbers from the equation and/or graph.

Students can earn 1 point by doing one of the following:

- writes a verbal description of the amount of money in the lunch account based on the number of days lunch is bought
- writes a partially correct description of the amount of money in the lunch account based on the number of days lunch is bought and uses specific numbers from the equation and/or graph.

Sample item for Performance Expectation 8.1.E

Dimitri's family has a fish tank. The height of the water in the fish tank during one week is represented by the line on the graph.



- Describe what the y-intercept of the line represents in the situation.

- Describe what the slope of the line represents in the situation.

2-point response: The student shows understanding of interpreting the slope and y-intercept of the graph of a linear function representing a contextual situation by doing the following:

- describes the y-intercept as the starting height of the water, or equivalent
- describes the slope as the decrease in water height each day, or equivalent.

Students can earn 1 point by doing one of the following:

- describes the y-intercept as the starting height of the water, or equivalent
- describes the slope as the decrease in water height each day, or equivalent.

Sample item for Performance Expectation 8.2.F

Nadifa is designing an art project. She will use pieces of wire for the outline of each shape in the art project. She wants one shape to be a right triangle. She has these lengths of wire.

3 inches, 5 inches, 8 inches, 12, inches, 13 inches

Determine which three lengths of wire could be the side lengths of a right triangle.

Show how you used the Pythagorean Theorem to determine your answer.

Which three lengths of wire could be the side lengths of a right triangle?

_____

2-point response: The student shows understanding of solving a word problem by doing the following:

Understanding:

- uses 5, 12, 13

Procedure:

- shows a procedure involving the Pythagorean Theorem to determine the three lengths of wire that could be the side lengths of a right triangle

Answers:

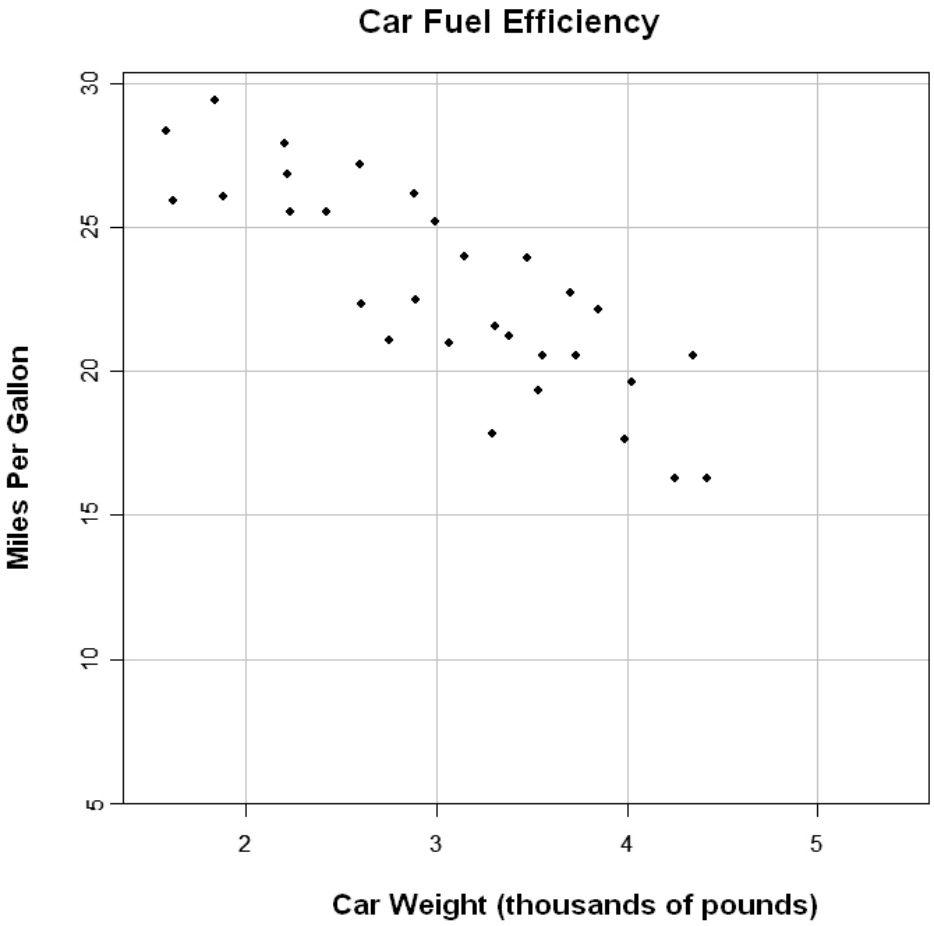
- writes 5, 12, and 13, or equivalent.

Students can earn 1 point by doing one of the following:

- uses 3, 5, 8, 12, and/or 13 and shows a procedure involving the Pythagorean Theorem that could lead to the three lengths of wire
- writes 5, 12, and 13.

Sample item for Performance Expectation 8.3.C

Rory is researching the fuel efficiency of several cars built this year. He found this scatterplot online. He wants to use the scatterplot to predict the fuel efficiency in miles per gallon of a car that weighs 5,000 pounds.



- Draw a trend line that models the data in the scatterplot. You must use a ruler or straightedge.
- Use your trend line to predict the fuel efficiency in miles per gallon for a car that weighs 5,000 pounds.

What is the predicted fuel efficiency for a car that weighs 5,000 pounds?

_____ miles per gallon

2-point response: The student shows understanding of sketching and using a trend line to make predictions by doing the following:

- draws a single line that models all the data in the scatterplot
- writes a number in the interval of 14 to 16, inclusive.

Students can earn 1 point by doing one of the following:

- draws a single line that models all the data in the scatterplot
- writes a number in the interval of 14 to 16, inclusive.

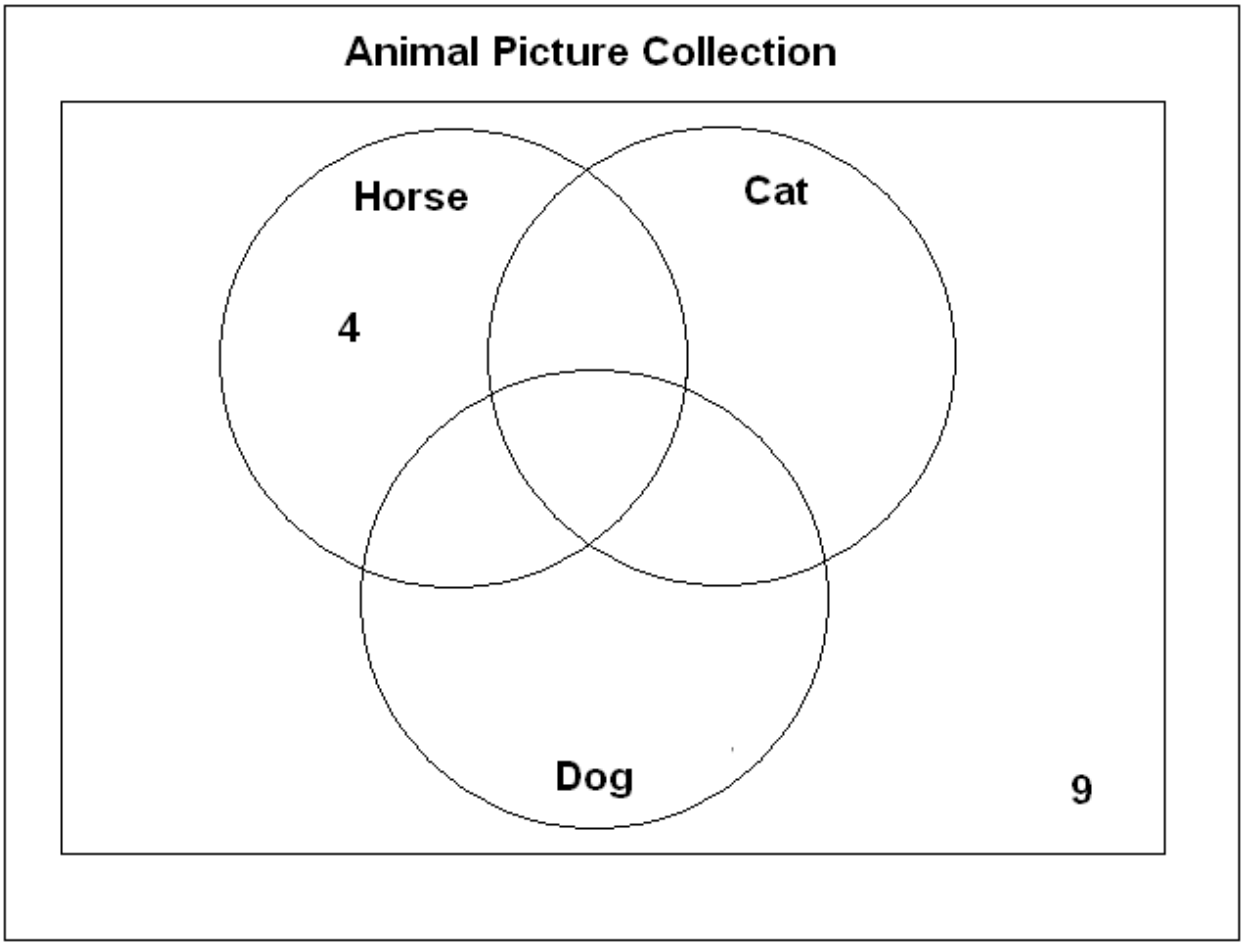
Sample item for Performance Expectation 8.3.G

Frida is sorting a collection of animal pictures.

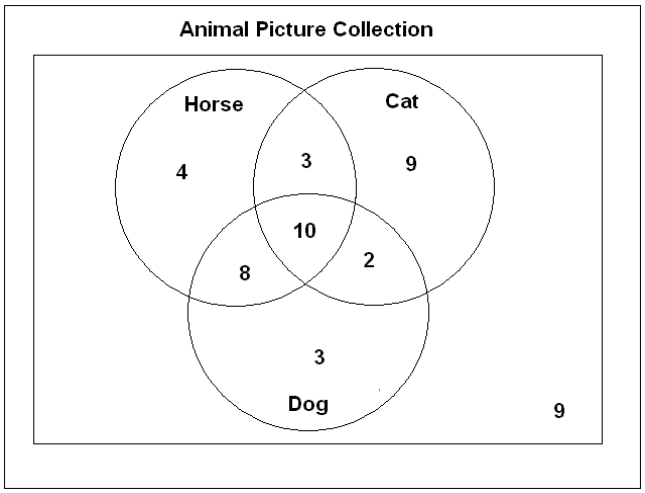
— There are a total of 48 pictures in the collection.
— 2 pictures have both a cat and a dog, but not a horse.
— 10 pictures have a horse, a cat, and a dog.
— 18 pictures have both a horse and a dog.
— 3 pictures have only a dog.
— 25 pictures have a horse.

Frida started to make a Venn diagram to organize the pictures in the collection.

Complete the Venn diagram to represent all the pictures in the collection.



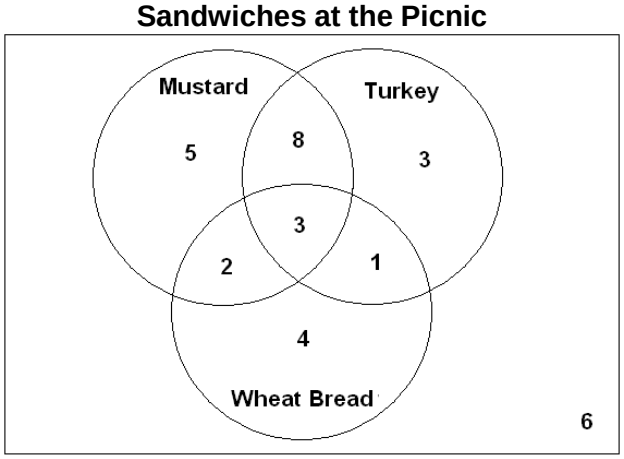
2-point response: The student shows understanding of solving multi-step problems using Venn diagrams by writing 6 values to complete the diagram.
Example:



Students can earn 1 point by writing 4 of the 6 values in the Venn diagram.

Sample item for Performance Expectation 8.5.G (8.3.G)

Steven, Gerome, and Francis are at a picnic. All three boys like sandwiches that have either turkey or mustard, but they do not like wheat bread. The Venn diagram shows the different kinds of sandwiches at the picnic.



The three boys each say there are a different number of sandwiches that have either turkey or mustard but not wheat bread.

Steven says there are 8 sandwiches.
Gerome says there are 16 sandwiches.
Francis says there are 22 sandwiches.

- Determine which boy said the correct number of sandwiches.
- Use specific numbers from the Venn diagram to support your answer.

Which boy said the correct number of sandwiches? _____

2-point response: The student shows understanding of extracting mathematical information from diagrams to draw conclusions and justify reasoning by doing the following:

- uses specific numbers from the Venn diagram to support why Gerome is correct or why Steven and Francis are not correct
- writes Gerome, or equivalent.

Students can earn 1 point by doing one of the following:

- describes why Steven and/or Francis is not correct
- writes Gerome, or equivalent.

Other Sources of Sample Grade 6-8 MSP Items

More sample items can also be found in the following resources:

- Updates for 2011: http://www.k12.wa.us/Mathematics/pubdocs/GR6-8UpdatesFor2011.pdf

  This document contains sample items in multiple choice, completion, and short answer formats, with solutions.

- Quick Guides of previously released WASL items aligned to the new math standards:

  - Grade 6: http://www.k12.wa.us/Mathematics/pubdocs/QuickGuide_GR6.pdf
  - Grade 7: http://www.k12.wa.us/Mathematics/pubdocs/QuickGuide_GR6.pdf
  - Grade 8: http://www.k12.wa.us/Mathematics/pubdocs/QuickGuide_GR8.pdf

  These documents contain previously-released WASL items that align to the Mathematics Standards for EOC.

- MSP Supports Moodle: http://moodle.ospi.k12.wa.us/course/view.php?id=28

  This site contains a database of teacher-created resources where educators can share sample items and assessments.

Contact Information

Sign-up now for Movers and Shakers!
Receive pertinent mathematics assessment information and updates, meeting and workshop opportunities, and other mathematics notices on the Movers and Shakers email distribution list. To join, please send a request to felecia.mckinney@k12.wa.us.

Mathematics Assessment Webpage:
http://www.k12.wa.us/mathematics/

OSPI Moodle Server:
http://moodle.ospi.k12.wa.us/

Contact Information:

Grades 3-5
Mary Holmberg
OSPI Mathematics Assessment Specialist
mary.holmberg@k12.wa.us
(360) 725-6235

Grades 6-8
Anton Jackson
OSPI Mathematics Assessment Specialist
anton.jackson@k12.wa.us
(360) 725-6437

High School/End-of-Course
Patty Stephens
OSPI Mathematics Assessment Specialist
patty.stephens@k12.wa.us
(360) 725-6440