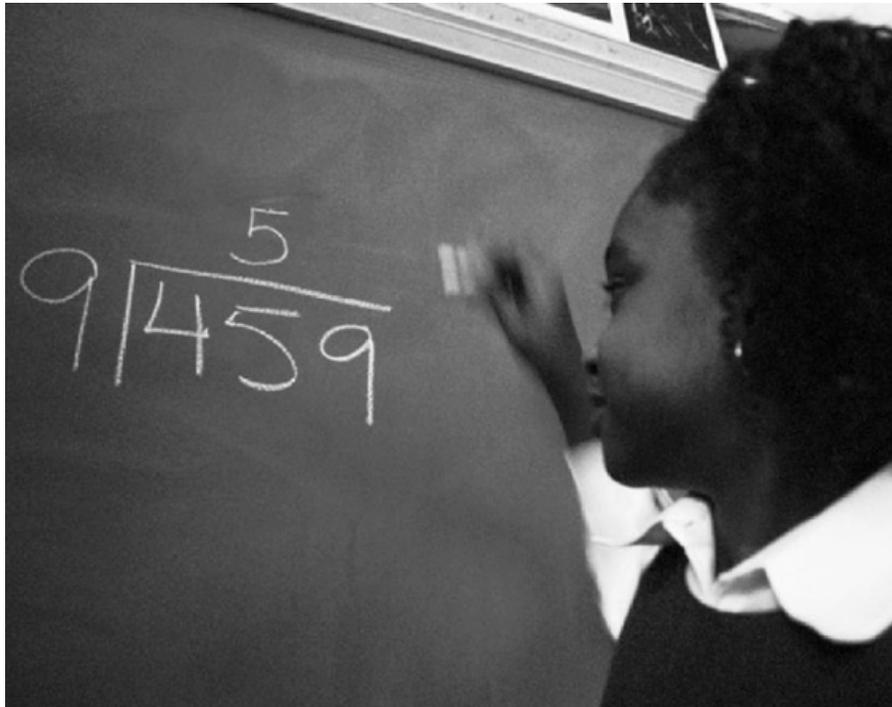


**OKLAHOMA SCHOOL TESTING PROGRAM
OKLAHOMA MODIFIED ALTERNATE
ASSESSMENT PROGRAM**

Test and Item Specifications

Mathematics
Grade 7



2012-2013 Edition

Oklahoma State Department of Education
Oklahoma City, Oklahoma

Revised
March 2013

OKLAHOMA MODIFIED ALTERNATE ASSESSMENT PROGRAM

TEST AND ITEM SPECIFICATIONS

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Purpose

The purpose of this test is to measure Oklahoma seventh-grade students' level of proficiency in mathematics. On the Grade 7 Mathematics Test, students are required to respond to a variety of items linked to the eighth-grade mathematics content standards identified in the *Oklahoma College, Career, and Citizen Ready (C³) Standards*. All mathematics test forms will assess the identified standards and objectives listed below. The following standards and objectives are intended to summarize the knowledge as identified in *Oklahoma C³ Standards*.

Oklahoma C³ Grade 7 Content Standards and Objectives
Algebraic Reasoning: Patterns and Relationships <ul style="list-style-type: none"> • Linear Relationships (1.1) • Solving Equations (1.2) • Solving and Graphing Inequalities (1.3)
Number Sense and Operation <ul style="list-style-type: none"> • Number Sense (2.1) • Number Operations (2.2)
Geometry <ul style="list-style-type: none"> • Classifying Figures (3.1) • Lines and Angles (3.2) • Transformations (3.3)
Measurement <ul style="list-style-type: none"> • Perimeter and Area (4.1) • Circles (4.2) • Composite Figures (4.3)
Data Analysis <ul style="list-style-type: none"> • Data Analysis (5.1) • Probability (5.2) • Central Tendency (5.3)



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General Considerations

It is necessary to create test items that are reliable, fair, and targeted to the *Oklahoma C³* standards listed on the following pages. There are some general considerations and procedures for effective item development. These considerations include, but are not limited to, the following:

1. Each test form contains items assessing all content standards listed in the Test Blueprint for seventh-grade mathematics.
2. Test items that assess each standard are not limited to one particular type of response format.
3. Test questions attempt to focus on content that is authentic and that seventh-grade students can relate to and understand.
4. Test items are worded precisely and clearly.
5. All items are reviewed to eliminate language that shows bias or is otherwise likely to disadvantage a particular group of students. That is, items do not display unfair representations of gender, race, disability, culture, or religion; nor do items contain elements that are offensive to any such groups.
6. All answer choices in multiple-choice items (the key and all distractors) are similar in length and syntax. Students should not be able to rule out a wrong answer or identify a correct response solely because it looks or sounds different from the other answer choices. Distractors are created so that students reason their way to the correct answer rather than simply identify incorrect responses because of a distractor's obviously inappropriate nature. Distractors should always be plausible (but incorrect) in the context of the item stem. Correct responses are approximately equally distributed among As, Bs, and Cs.

Universal Test Design Considerations

Universal design, as applied to assessments, is a concept that allows the widest possible range of students to participate in assessments and may even reduce the need for accommodations and alternative assessments by expanding access to the tests themselves. In the Oklahoma Modified Alternate Assessment Program, modifications have been made to some items that simplify and clarify instructions, and provide maximum readability, comprehensibility, and legibility.

Universal Modifications

- Minimize the number of questions on the page (limit to 2 or 3).
- Use a larger font size.
- Provide only three answer options instead of four.
- Highlight the main points in the question or passage by underlining and using boldface.
- Allow for the same accommodations as in the standard assessment.
- Avoid questions that require students to select the better/best answer.
- Eliminate answer choices that give students the option of making no changes to the item.
- Be consistent in wording of directions across grades and subjects.
- Minimize the use of pronouns and prepositional phrases.
- Avoid the use of multiple-meaning words and words that can function as more than part of speech.
- Enlarge art when possible.
- Simplify art when possible, (i.e. removing unnecessary labels, use less gray scale, use thicker lines when outlining, etc.).
- Box informational text in an item.
- Bullet information when possible (e.g. bullet detailed information or processes).
- Reduce reading load of stem, stimuli, and answer options when possible.
- Use Verdana font.
- Revise answer options to address parallelism and minimize outliers.

Mathematics Items

- Allow for read-aloud and calculators format.
- For lower grades, display numbers on all sides of figures for questions about perimeter.
- Unless required by standard, avoid items with negative and positive answer choices that use the same number.
- Place any items with coordinate grids on one page.
- For lower grades, use grids for questions.
- Be consistent with qualifiers in the stem and answer choices.
- Avoid questions that use best or closest.
- Avoid complicated art.
- List coordinate grids in answer options vertically with plenty of space between the answer options to make the grid more accessible to the visually impaired (however, avoid spanning item over two pages).
- Simplify reading load, including vocabulary, when possible.
- Eliminate stimuli sets.
- Delete one part of a compound answer choice when possible.
- Delete griddable items, negative items, and items that cannot be modified based on guidelines.

- Delete extraneous information including irrelevant material and unnecessary words in items or graphics.
- Simplify complex sentence structure and vocabulary in item and answer choices without eliminating math vocabulary.
- Change passive voice to active voice when appropriate.
- Add precise language to provide additional context for clarification.
- Use consistent language within an item in order to focus student attention on what is being asked.
- Revise text as necessary to maintain the authenticity and logic of the item due to modifications.
- Use bullets to clearly organize complex items into smaller, meaningful parts.
- Direct student attention to graphics.
- Simplify visual complexity of graphics.

Universal Modifications

- Provide new text and/or reorganize existing text within the question to explain or clarify the graphic.
- Provide additional graphics to support text, emphasize ideas, and facilitate comprehension.
- Reduce the number of variables and simplify digits in item when appropriate.
- Limit the number of steps and/or operations in multi-step problems.
- Provide appropriate formula and/or conversion near the item.
- Provide explicit directions to explain a process such as measuring (as long as it does not impact reading load).

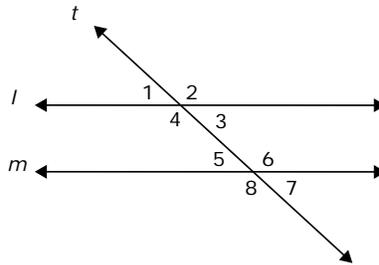
Below is an example of an OCCT item followed by a modified version of the item. The modified version of the item was created using the modification list on pages 5 and 6.

OCCT Oklahoma C³ 3.2 Sample Item:

Depth of Knowledge: 1

Correct Answer: B

The drawing shows parallel lines l and m intersected by transversal t .



Which statement about angles 2 and 4 is true?

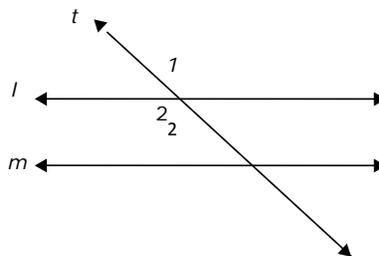
- Ⓐ They are interior angles.
- Ⓑ They are vertical angles.
- Ⓒ They are corresponding angles.
- Ⓓ They are complementary angles.

Modified OMAAP Oklahoma C³ 3.2 Sample Item:

Depth of Knowledge: 1

Correct Answer: B

Lines l and m are parallel.



Which statement about angles 1 and 2 is true?

- Ⓐ They are interior angles.
- Ⓑ They are vertical angles.
- Ⓒ They are corresponding angles.

Multiple-Choice Item Rules

- All items clearly indicate what is expected in a response and help students focus on their response.
- Each multiple-choice item has a stem (question, statement, or incomplete statement, and/or graphic component) and three answer (or completion) options, only one of which is correct.
- Multiple-choice item stems present a complete problem so that students know what to do before looking at the answer choices; students should not need to read all answer choices before knowing what is expected.

In summary, mathematics-test items assess whether students understand mathematical concepts and procedures, communicate their understanding effectively in mathematical terms, approach problems, and develop viable solutions.

All items developed using these specifications are reviewed by Oklahoma educators and approved by the Oklahoma State department of Education. The distribution of newly developed or modified items is based on content and process alignment, difficulty, cognitive ability, percentage of art/graphics, and grade level appropriateness as determined by an annual Item Development Plan approved by the Oklahoma State Department of Education.

Test Structure, Format, and Scoring

The test will consist of 40 - 43 operational multiple-choice items, which will be written at a reading level two grade levels below a seventh-grade audience and will include three responses from which to choose: the correct answer and two distractors.

Each multiple-choice item is scored as correct or incorrect. The student's raw score is converted to a scaled score using the number correct scoring method.

Test Alignment with Oklahoma C³ Standards

Criteria for Aligning the Test with the Oklahoma C³ Standards and Objectives	
1. Categorical Concurrence	The test is constructed so that there are at least six items measuring each <i>Oklahoma C³</i> standard, with the content category consistent with the related standard. The number of items, six, is based on estimating the number of items that could produce a reasonably reliable estimate of a student's mastery of the content measured.
2. Depth of Knowledge Consistency	The test is constructed using items from a variety of Depth of Knowledge levels that are consistent with the processes students need in order to demonstrate proficiency for each <i>Oklahoma C³</i> objective.
3. Range of Knowledge Correspondence	The test is constructed so that at least 50% of the objectives for an <i>Oklahoma C³</i> standard have at least one corresponding assessment item.
4. Balance of Representation	The test is constructed according to the Test Blueprint, which reflects the degree of representation given on the test to each <i>Oklahoma C³</i> standard and objective in terms of the percentage of total test items measuring each standard and the number of test items measuring each objective.
5. Source of Challenge	Each test item is constructed in such a way that the major cognitive demand comes directly from the targeted <i>Oklahoma C³</i> objective or concept being assessed, not from specialized knowledge or cultural background that the test-taker may bring to the testing situation.

Test Blueprint

The Test Blueprint reflects the degree to which each *Oklahoma C³* standard and objective is represented on the test. The overall distribution of operational items in a test form is intended to look as follows:

<i>Oklahoma C³</i> Standards & Objectives	Ideal Number of Items for Alignment to <i>Oklahoma C³*</i>	Ideal ¹ Percentage of Items
Algebraic Reasoning: Patterns and Relationships	12–13	28%–30%
Linear Relationships (1.1)	3–5	
Solving Equations (1.2)	3–5	
Solving and Graphing Inequalities (1.3)	3–5	
Number Sense and Operation	8–9	19%–21%
Number Sense (2.1)	4–5	
Number Operations (2.2)	4–5	
Geometry	6–7	14%–16%
Classifying Figures (3.1)	2–3	
Lines and Angles (3.2)	2–3	
Transformations (3.3)	2–3	
Measurement	7–8	16%–19%
Perimeter and Area (4.1)	3–4	
Circles (4.2)	1–3	
Composite Figures (4.3)	1–3	
Data Analysis	6–7	14%–16%
Data Analysis (5.1)	1–3	
Probability (5.2)	1–3	
Central Tendency (5.3)	1–3	
Total Test	40–43²	100%

¹ Percentages are approximations and may result in a sum other than 100 due to rounding.

² The actual number of items scored for a student may be slightly lower pending a review of item statistics. Student performance on the multiple-choice test will be reported to the standard level.

Overview of Item Specifications

For each *Oklahoma C³* standard, item specifications are organized under the following headings:

- *Oklahoma C³* Standard and *Oklahoma C³* Objective
- Item Specifications
 - a. Emphasis
 - b. Stimulus Attributes
 - c. Format
 - d. Content Limits
 - e. Distractor Domain
 - f. Sample Test Items

The headings “*Oklahoma C³* Standard” and “*Oklahoma C³* Objective” state the standard and objective being measured as found in the seventh-grade mathematics section of the *Oklahoma College, Career, and Citizen Ready (C³) Standards* document.

The heading “Item Specifications” highlights important points about the item’s emphasis, stimulus attributes, format, content limits, and distractor domain. Although it is sometimes possible to score single items for more than one concept, all items in these tests are written to address a single content standard as the primary concept.

All items will assess objectives using only depth-of-knowledge levels 1, 2, or 3. Descriptions of the depth-of-knowledge levels for Mathematics are as follows:

Level 1 requires the student to recall facts, terms, definitions, or simple procedures; perform simple algorithms; or apply formulas. One-step, well-defined, or straight algorithmic procedures should be included at this level.

Level 2 requires the student to make some decisions as to how to approach the problem or activity. Level 2 activities include making observations and collecting data; classifying, comparing, and organizing data; and organizing and displaying data in tables, charts, and graphs.

Level 3 requires complex reasoning, planning, developing, using evidence, and a higher level of thinking. These processes typically require an extended amount of time. The cognitive demands of the item should be high, and the work should be complex. In order to be considered at this level, students are required to make several connections (relate ideas within the content area or among the content areas) and select one approach among many alternatives as to how the situation should be solved. Level 3 activities include making conjectures, drawing conclusions from observations, citing evidence, developing a logical argument for concepts, explaining phenomena in terms of concepts, and using concepts to solve nonroutine problems.

Depth of Knowledge Assessed by Test Items

The test will approximately reflect the following depth of knowledge distribution of items:

Depth of Knowledge	Percentage of Items
Level 1—Recall	20–25%
Level 2—Basic Reasoning	60–65%
Level 3—Complex and Extended Reasoning	10–15%

This is the ideal depth of knowledge distribution of items. There may be slight differences in the actual distribution of the upcoming testing session.

Note about the Item Specifications and Sample Items:

With the exception of content limits, the item specifications give suggestions of what might be included and do not give an exhaustive list of what can be included.

These sample test items are not intended to be definitive in nature or construction, as the stimuli and test items may differ from one test form to another, as may their presentation.

*Oklahoma C³***MATHEMATICS PROCESS STANDARDS****Grades 6-8**

The National Council of Teachers of Mathematics (NCTM) has identified five process standards: Problem Solving, Reasoning and Proof, Communication, Connections, and Representation. Active involvement by students using these processes is likely to broaden mathematical understandings and lead to increasingly sophisticated abilities required to meet mathematical challenges in meaningful ways.

Process Standard 1: Problem Solving

1. Develop and test strategies to solve practical, everyday problems which may have single or multiple answers.
2. Use technology to generate and analyze data to solve problems.
3. Formulate problems from situations within and outside of mathematics and generalize solutions and strategies to new problem situations.
4. Evaluate results to determine their reasonableness.
5. Apply a variety of strategies (e.g., restate the problem, look for a pattern, diagrams, solve a simpler problem, work backwards, trial and error) to solve problems, with emphasis on multistep and non-routine problems.
6. Use oral, written, concrete, pictorial, graphical, and/or algebraic methods to model mathematical situations.

Process Standard 2: Communication

1. Discuss, interpret, translate (from one to another) and evaluate mathematical ideas (e.g., oral, written, pictorial, concrete, graphical, algebraic).
2. Reflect on and justify reasoning in mathematical problem solving (e.g., convince, demonstrate, formulate).
3. Select and use appropriate terminology when discussing mathematical concepts and ideas.

Process Standard 3: Reasoning

1. Identify and extend patterns and use experiences and observations to make suppositions.
2. Use counter examples to disprove suppositions (e.g., all squares are rectangles, but are all rectangles squares?).
3. Develop and evaluate mathematical arguments (e.g., agree or disagree with the reasoning of other classmates and explain why).
4. Select and use various types of reasoning (e.g., recursive [loops], inductive [specific to general], deductive [general to specific], spatial, and proportional).

Process Standard 4: Connections

1. Apply mathematical strategies to solve problems that arise from other disciplines and the real world.
2. Connect one area or idea of mathematics to another (e.g., relates equivalent number representations to each other, relate experiences with geometric shapes to understanding ratio and proportion).

Process Standard 5: Representation

1. Use a variety of representations to organize and record data (e.g., use concrete, pictorial, and symbolic representations).
2. Use representations to promote the communication of mathematical ideas (e.g., number lines, rectangular coordinate systems, scales to illustrate the balance of equations).
3. Develop a variety of mathematical representations that can be used flexibly and appropriately (e.g., base-10 blocks to represent fractions and decimals, appropriate graphs to represent data).
4. Use a variety of representations to model and solve physical, social, and mathematical problems (e.g., geometric objects, pictures, charts, tables, graphs).

*Oklahoma C³***MATHEMATICS CONTENT STANDARDS****Grade 7**

Asterisks (*) have been used to identify standards and objectives that are not assessed by the Oklahoma School Testing Program (OSTP) in the original *Oklahoma C³* curriculum.

The student applies a wide range of strategies to describe, interpret, evaluate, and analyze a variety of math problems and contexts.

Standard 1: Algebraic Reasoning: Patterns and Relationships—The student will use number properties and algebraic reasoning to identify, simplify, and solve simple linear equations and inequalities.

1. Identify, describe, and analyze functional relationships (linear and nonlinear) between two variables (e.g., as the value of x increases on a table, do the values of y increase or decrease, identify a positive rate of change on a graph and compare it to a negative rate of change).
2. Write and solve two-step equations with one variable using number sense, the properties of operations, and the properties of equality (e.g., $-2x + 4 = -2$).
3. Inequalities: Model, write, solve, and graph one-step linear inequalities with one variable.

Standard 2: Number Sense and Operation—The student will use numbers and number relationships to solve a variety of problems.

1. Number Sense
 - a. Compare and order positive and negative rational numbers.
 - b. Build and recognize models of perfect squares to find their square roots and estimate the square root of other numbers (e.g., the square root of 12 is between 3 and 4).
2. Number Operations
 - a. Solve problems using ratios and proportions.
 - b. Solve percent application problems (e.g., discounts, tax, finding the missing value of percent/part/whole).
 - c. Simplify numerical expressions with integers, exponents, and parentheses using order of operations.

Standard 3: Geometry—The student will apply the properties and relationships of plane geometry in a variety of contexts.

1. Classify regular and irregular geometric figures including triangles and quadrilaterals according to their sides and angles.
2. Identify and analyze the angle relationships formed by parallel lines cut by a transversal (e.g., alternate interior angles, alternate exterior angles, adjacent, and vertical angles).
3. Construct geometric figures and identify geometric transformations on the rectangular coordinate plane (e.g., rotations, translations, reflections, magnifications).

Standard 4: Measurement—The student will use measurement to solve problems in a variety of contexts.

1. Develop and apply the formulas for perimeter and area of triangles and quadrilaterals to solve problems.
2. Apply the formulas for the circumference and area of a circle to solve problems.
3. Find the area and perimeter of composite figures to solve application problems.

Standard 5: Data Analysis - The student will use data analysis, probability, and statistics to interpret data in a variety of contexts.

1. Data Analysis: Compare, translate, and interpret between displays of data (e.g., multiple sets of data on the same graph, data from subsets of the same population, combinations of diagrams, tables, charts, and graphs).
2. Probability: Determine the probability of an event involving “or,” “and,” or “not” (e.g., on a spinner with one blue, two red, and two yellow sections, what is the probability of getting a red or a yellow?).
3. Central Tendency: Compute the mean, median, mode, and range for data sets and understand how additional data or outliers in a set may affect the measures of central tendency.

OKLAHOMA C³ STANDARDS**SAMPLE TEST ITEMS BY STANDARD****Grade 7****Oklahoma C³ Standard:**

Standard 1: Algebraic Reasoning: Patterns and Relationships - The student will use number properties and algebraic reasoning to identify, simplify, and solve simple linear equations and inequalities.

Oklahoma C³ Objective:

1. Identify, describe, and analyze functional relationships (linear and nonlinear) between two variables (e.g., as the value of x increases on a table, do the values of y increase or decrease, identify a positive rate of change on a graph and compare it to a negative rate of change).

Item Specifications:Emphasis:

Identify, translate, and analyze attributes of functional relationships.

Stimulus Attributes:

Test items may include illustrations of the following: coordinate graphs, number lines, balances, and other diagrams.

Format:

- Identify, describe, and analyze functional relationships involved in mathematical and real-world situations.
- Translate between algebraic and geometric representations of linear equations.
- Graph points on a coordinate plane from a table.
- Analyze attributes of algebraic and geometric representations of linear equations.

Content Limits:

- Limit coefficients to integers or common fractions.
- Limit linear equations to one-step equations.
- Limit the range of 4–quadrant coordinate graphs to between -10 and 10.
- Limit change of slope to opposites, integers, and common fractions, or simple identification of steepness, or closer to vertical or horizontal (without calculation).
- Limit the interpretation of solutions to linear equations to simple graphs that require identification of y -intercepts and positive and negative slopes (only the sign may change in the options).
- Limit quadratic and exponential functions to graphic representation.

Distractor Domain:

- Common errors
- Incorrect procedures
- Inappropriate operations with variables

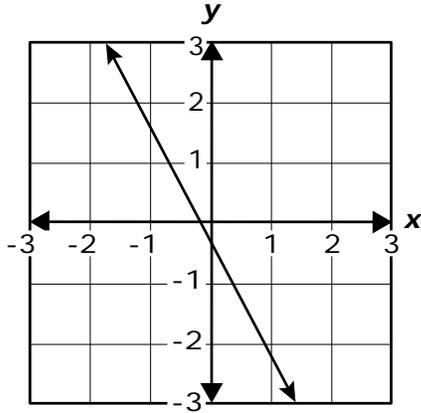
Modified Oklahoma C³ 1.1 Sample Item:

Depth of Knowledge: 1

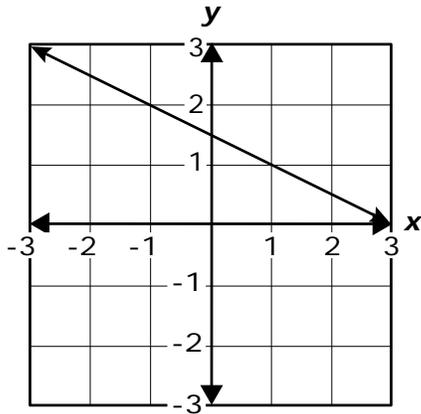
Correct Answer: C

Which graph has a positive slope?

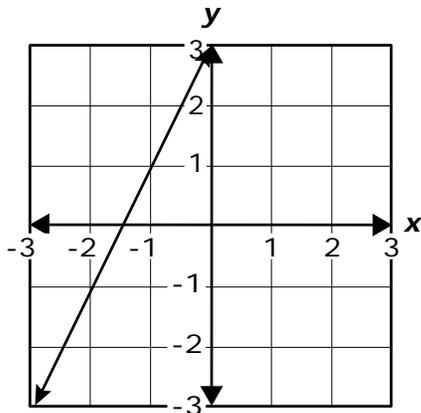
(A)



(B)



(C)



Depth of Knowledge: 2

Correct Answer: B

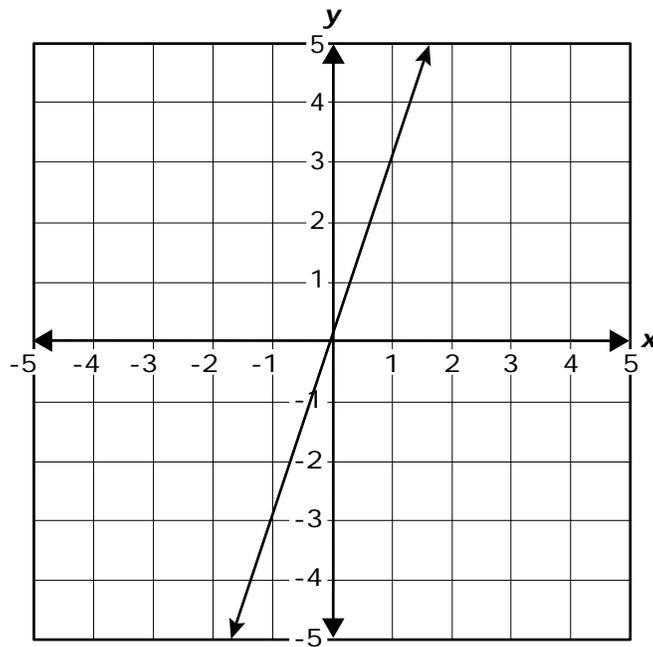
x	y
-3	6
0	3
3	0
6	-3

What happens to the value of y as the value of x increases?

- A** The value of y increases.
- B** The value of y decreases.
- C** The value of y stays the same.

Depth of Knowledge: 2

Correct Answer: A



What is the equation of this graph?

- A** $y = 3x$
- B** $y = -3x$
- C** $y = \frac{1}{3}x$

Oklahoma C³ Standard:

Standard 1: Algebraic Reasoning: Patterns and Relationships - The student will use number properties and algebraic reasoning to identify, simplify, and solve simple linear equations and inequalities.

Oklahoma C³ Objective:

2. Write and solve two-step equations with one variable using number sense, the properties of operations, and the properties of equality (e.g., $-2x + 4 = -2$).

Item Specifications:Emphasis:

Write and solve two-step equations.

Stimulus Attributes:

Test items may include illustrations of the following: coordinate graphs, number lines, balance scales, pulleys, and other diagrams.

Format:

- Write two-step equations with one variable.
- Solve two-step equations with one variable.

Content Limits:

- Limit equations to those involving only integers.

Distractor Domain:

- Common errors
- Incorrect procedures
- Inappropriate operations with variables

Modified Oklahoma C³ 1.2 Sample Item:

Depth of Knowledge: 2

Correct Answer: C

$$4x - 10 = 18$$

What value of x makes this equation true?

- A 2
- B 4
- C 7

Depth of Knowledge: 2

Correct Answer: A

$$2x + 3 = -13$$

What value of x makes this equation true?

- A -8
- B 5
- C 8

Depth of Knowledge: 2

Correct Answer: A

Stacey delivers newspapers.

- **Each week, she earns \$15 plus \$2 for each customer.**

Which equation can Stacey use to find c , the number of customers she needs to earn \$25 each week?

- Ⓐ $2c + 15 = 25$
- Ⓑ $15c + 2 = 25$
- Ⓒ $17c = 25$

Oklahoma C³ Standard:

Standard 1: Algebraic Reasoning: Patterns and Relationships - The student will use number properties and algebraic reasoning to identify, simplify, and solve simple linear equations and inequalities.

Oklahoma C³ Objective:

3. Inequalities: Model, write, solve, and graph one-step linear inequalities with one variable.

Item Specifications:Emphasis:

Identify, write, solve, and graph the solutions to one-step linear inequalities.

Stimulus Attributes:

Test items may include illustrations of the following: number lines, balance scales, pulleys, and other diagrams.

Format:

- Write one-step linear inequalities with one variable.
- Solve and graph the solution to a one-step linear inequality.
- Identify one-step inequalities that model mathematical and real-world situations.

Content Limits:

- Limit inequalities to one-step.
- Limit inequalities to one variable.
- Limit inequalities to those involving only integers.
- Limit multiplication and division by a variable to positive integers.
- No compound inequalities.

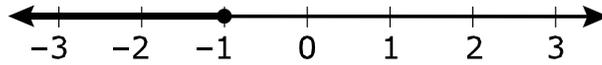
Distractor Domain:

- Common errors
- Incorrect procedures
- Inappropriate operations with variables

Modified Oklahoma C³ 1.3 Sample Item:

Depth of Knowledge: 1

Correct Answer: B



Which inequality represents the solution set shown on the number line?

- (A)** $n < -1$
- (B)** $n \leq -1$
- (C)** $n > -1$

Depth of Knowledge: 2

Correct Answer: A

$$x - 3 > 5$$

Which value of x makes this inequality true?

- (A)** 9
- (B)** 8
- (C)** 5

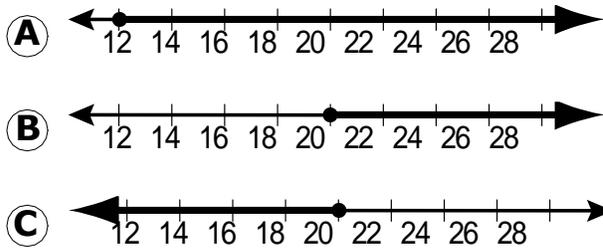
Depth of Knowledge: 3

Correct Answer: B

A teacher needs to grade 10 papers.

- **The teacher takes at least 2 minutes grading each paper.**

Which number line represents the total number of minutes the teacher takes grading the 10 papers?



Oklahoma C³ Standard:

Standard 2: Number Sense and Operation - The student will use numbers and number relationships to solve a variety of problems.

Oklahoma C³ Objective:

1. Number Sense
 - a. Compare and order positive and negative rational numbers.

Item Specifications:Emphasis:

Demonstrate an understanding of the structure of rational numbers.

Stimulus Attributes:

Test items may include illustrations of the following: number lines, and charts.

Format:

- Compare, order, and translate among representations of rational numbers.

Content Limits:

- Limit mathematical and real-life context to age-appropriate situations.
- Limit decimals to thousandths.
- Limit computations involving only fractions to halves, thirds, fourths, fifths, sixths, eighths, tenths, and twelfths.

Distractor Domain:

- Computational errors
- Common errors

Modified Oklahoma C³ 2.1a Sample Item:

Depth of Knowledge: 2

Correct Answer: C

Adam, Dave, Kyla, and Dana gathered eggs.

- **The table shows what part of the eggs each child gathered.**

Eggs Gathered

Name	Part of the Total Eggs Gathered
Adam	0.36
Dave	0.2
Kyla	0.4
Dana	0.04

Which list shows these amounts ordered from greatest to least?

- Ⓐ 0.4, 0.04, 0.36, 0.2
- Ⓑ 0.36, 0.04, 0.4, 0.2
- Ⓒ 0.4, 0.36, 0.2, 0.04

Depth of Knowledge: 3

Correct Answer: C

Which number is between -2.8 and $-2\frac{1}{2}$?

- (A)** -2.45
- (B)** -2.95
- (C)** -2.65

Oklahoma C³ Standard:

Standard 2: Number Sense and Operation - The student will use numbers and number relationships to solve a variety of problems.

Oklahoma C³ Objective:

1. Number Sense
 - b. Build and recognize models of perfect squares to find their square roots and estimate the square root of other numbers (e.g., the square root of 12 is between 3 and 4).

Item Specifications:Emphasis:

- Demonstrate an understanding of the relationship between integers and approximate square roots.
- Demonstrate an understanding of perfect squares and square roots through the use of models.

Stimulus Attributes:

- Test items may include illustrations of the following: 10-by-10 grids, counting manipulatives, two-dimensional geometric figures, tables, graphs, charts, scale drawings, data sets, and other diagrams.

Format:

- Use numbers to estimate square roots in mathematical, geometric, and real-world contexts.
- Use numbers to explore and identify square roots and perfect squares in mathematical, geometric, and real-world contexts.
- Use graphic representations including arrays and models of multiples to explore and identify square roots and perfect squares in mathematical, geometric, and real-world contexts.

Content Limits:

- Limit to perfect squares up to 25.
- Limit graphic representations to common two-dimensional geometric figures.
- Limit arrays to two-dimensional arrays.

Distractor Domain:

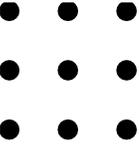
- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules or properties
- Use of incorrect equivalencies
- Incorrect interpretation of data display

Modified Oklahoma C³ 2.1b Sample Item:

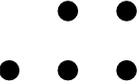
Depth of Knowledge: 1

Correct Answer: A

Which model represents 3^2 ?

(A) 

(B) 

(C) 

Depth of Knowledge: 3

Correct Answer: B

Josh has 17 identical square tiles.

What is the greatest number of square tiles Josh can use to create one big square?

(A) 10

(B) 16

(C) 17

Oklahoma C³ Standard:

Standard 2: Number Sense and Operation—The student will use numbers and number relationships to solve a variety of problems.

Oklahoma C³ Objective:

2. Number Operations
 - a. Solve problems using ratios and proportions.

Item Specifications:Emphasis:

- Demonstrate the ability to estimate and solve problems using ratios and proportions (limit to basic whole numbers).
- Demonstrate the ability to use ratio and proportion to estimate and solve mathematical and real-world problems.

Stimulus Attributes:

- Test items may include illustrations of the following: number lines, balances, two-dimensional geometric figures, tables, graphs, charts, maps, scale drawings, frequency charts, circle graphs, data sets, and other diagrams.

Format:

- Select and apply ratios and proportions to solve problems in mathematical, geometric, and real-world contexts.

Content Limits:

- Limit number of variables in a proportion to one.
- Limit numbers in proportions to whole numbers.
- Limit real-world contexts to age-appropriate situations.

Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules or properties
- Use of incorrect equivalencies

Modified Oklahoma C³ 2.2a Sample Item:

Depth of Knowledge: 2

Correct Answer: C

There are 42 students in Kim's band class.

- **Of those students, 11 are boys.**

Which proportion can be used to find x , the percent of students in the class that are boys?

Ⓐ $\frac{11}{31} = \frac{x}{100}$

Ⓑ $\frac{31}{11} = \frac{x}{100}$

Ⓒ $\frac{11}{42} = \frac{x}{100}$

Oklahoma C³ Standard:

Standard 2: Number Sense and Operation - The student will use numbers and number relationships to solve a variety of problems.

Oklahoma C³ Objective:

2. Number Operations

b. Solve percent application problems (e.g., discounts, tax, finding the missing value of percent/part/whole).

Item Specifications:**Emphasis:**

- Demonstrate the ability to estimate and solve problems using percents (limit to basic whole numbers).
- Demonstrate the ability to solve percent application problems (limit to 10%, 20%, 30%, 40%, and 50%).

Stimulus Attributes:

- Test items may include illustrations of the following: number lines, balances, two-dimensional geometric figures, tables, graphs, charts, maps, scale drawings, frequency charts, circle graphs, data sets, and other diagrams.

Format:

- Select and apply ratios and proportions, among other methods, to solve percent application problems in mathematical, geometric, and real-world contexts.

Content Limits:

- Limit percents to 10%, 20%, 30%, 40%, and 50%.
- Limit decimal points to the thousandths.

Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules or properties
- Use of incorrect equivalencies

Modified Oklahoma C³ 2.2b Sample Item:

Depth of Knowledge: 2

Correct Answer: C

The family ate at a restaurant.

- **The cost of the meal was \$45.**
- **They left a tip that was 20% of the cost of the meal.**

What was the amount of the tip?

- Ⓐ \$0.90
- Ⓑ \$2.00
- Ⓒ \$9.00

Oklahoma C³ Standard:

Standard 2: Number Sense and Operation - The student will use numbers and number relationships to solve a variety of problems.

Oklahoma C³ Objective:

2. Number Operations
 - c. Simplify numerical expressions with integers, exponents, and parentheses using order of operations.

Item Specifications:Emphasis:

- Demonstrate a working knowledge of positive and negative integers to simplify expressions in mathematical and real-world contexts.

Stimulus Attributes:

- Test items may include illustrations of the following: coordinate graphs, number lines, balances, two-dimensional geometric figures; rulers, thermometers, and other measuring instruments; calculator displays, tables, graphs, charts, data sets, and other diagrams.

Format:

- Apply the basic operations on positive and negative integers to simplify expressions in mathematical, geometric, and real-world contexts.

Content Limits:

- Limit to 2-digit integers.
- Limit exponents to whole numbers no greater than the third power.

Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules or properties

Modified Oklahoma C³ 2.2c Sample Item:

Depth of Knowledge: 2

Correct Answer: C

$$21 - (4 - 2^3)$$

What is the value of this expression?

- A 9
- B 17
- C 25

Oklahoma C³ Standard:

Standard 3: Geometry - The student will apply the properties and relationships of plane geometry in a variety of contexts.

Oklahoma C³ Objective:

1. Classify regular and irregular geometric figures including triangles and quadrilaterals according to their sides and angles.

Item Specifications:Emphasis:

- Demonstrate the ability to classify triangles and quadrilaterals based on sides and angles using a marked picture.

Stimulus Attributes:

- Test items may include illustrations of the following: coordinate graphs, two-dimensional geometric figures, protractors, geoboards, other geometric manipulatives, tables, graphs, charts, maps, data sets, and other diagrams.

Format:

- Classify triangles according to their attributes.
- Classify quadrilaterals according to their attributes.

Content Limits:

- For triangles, limit classifications to sides or angles.
- Limit quadrilaterals to rectangles, squares, parallelograms, rhombi, and trapezoids.
- Each graphic will include all necessary measurements.

Distractor Domain:

- Common errors
- Incorrect procedures
- Incorrect use of rules or properties

Modified Oklahoma C³ 3.1 Sample Item:

Depth of Knowledge: 1

Correct Answer: B

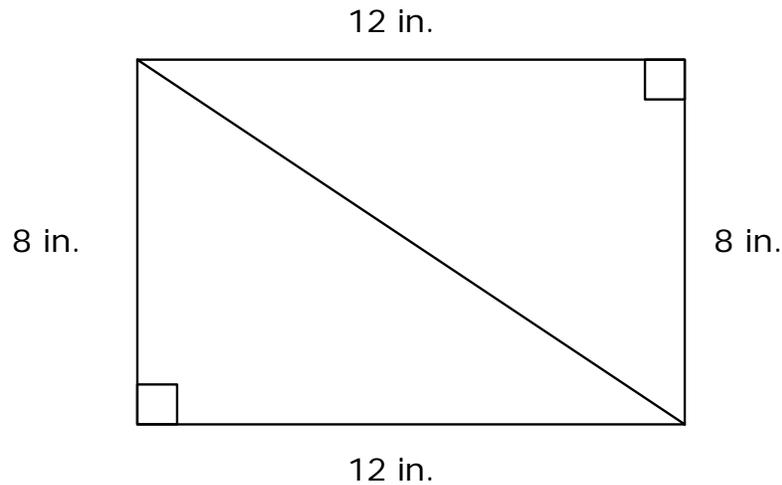
45°, 45°, and 90°**Which kind of triangle has angles with these three measures?**

- A** obtuse
- B** right
- C** acute

Depth of Knowledge: 2

Correct Answer: A

This figure shows the rectangle divided into two congruent triangles.



Which term describes these triangles?

- A scalene
- B isosceles
- C equilateral

Depth of Knowledge: 3

Correct Answer: B

A student drew a quadrilateral with these characteristics.

- **All of the sides have the same length.**
- **The opposite sides are parallel.**
- **Two of the angles are acute.**

What type of quadrilateral did the student draw?

- Ⓐ square
- Ⓑ rhombus
- Ⓒ trapezoid

Oklahoma C³ Standard:

Standard 3: Geometry - The student will apply the properties and relationships of plane geometry in a variety of contexts.

Oklahoma C³ Objective:

2. Identify and analyze the angle relationships formed by parallel lines cut by a transversal (e.g., alternate interior angles, alternate exterior angles, adjacent, and vertical angles).

Item Specifications:Emphasis:

- Identify and compare vertical angles.
- Demonstrate a working knowledge of vertical angles and their measures in geometric figures and polygons.
- May address angle relationships for corresponding angles, alternate-interior angles, or vertical angles

Stimulus Attributes:

- Test items may include illustrations of the following: coordinate graphs, two-dimensional geometric figures, protractors, geoboards, other geometric manipulatives, tables, graphs, charts, maps, data sets, and other diagrams.

Format:

- Identify and compare vertical angles and angle relationships based on their positions in geometric figures.
- Find the measures of vertical angles based on their positions and relationships in geometric figures.

Content Limits:

- Limit diagrams to no more than three intersecting lines.
- Limit to 2 parallel lines and 1 transversal.
- Limit geometric figures to two dimensions.

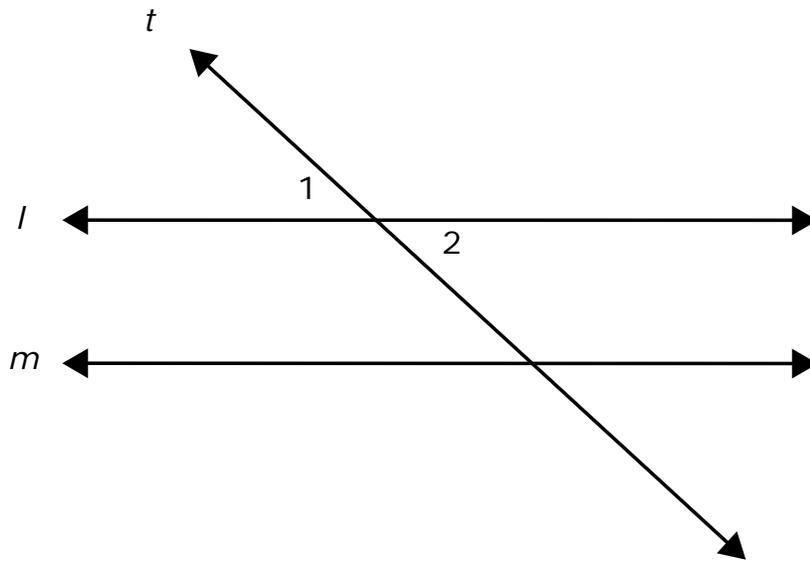
Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules or properties

Modified Oklahoma C³ 3.2 Sample Item:

Depth of Knowledge: 1

Correct Answer: B

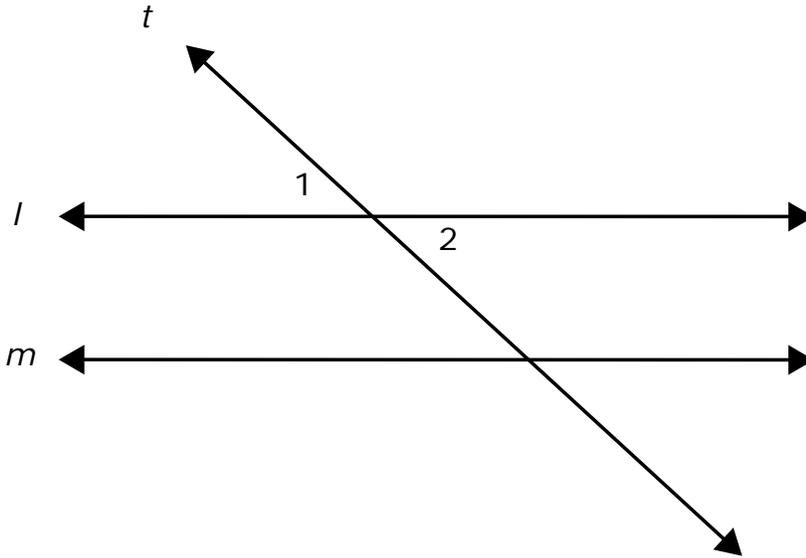
Line l and line m are parallel.**Which statement about angle 1 and angle 2 is true?**

- Ⓐ They are interior angles.
- Ⓑ They are vertical angles.
- Ⓒ They are corresponding angles.

Depth of Knowledge: 2

Correct Answer: B

Line l and line m are parallel.



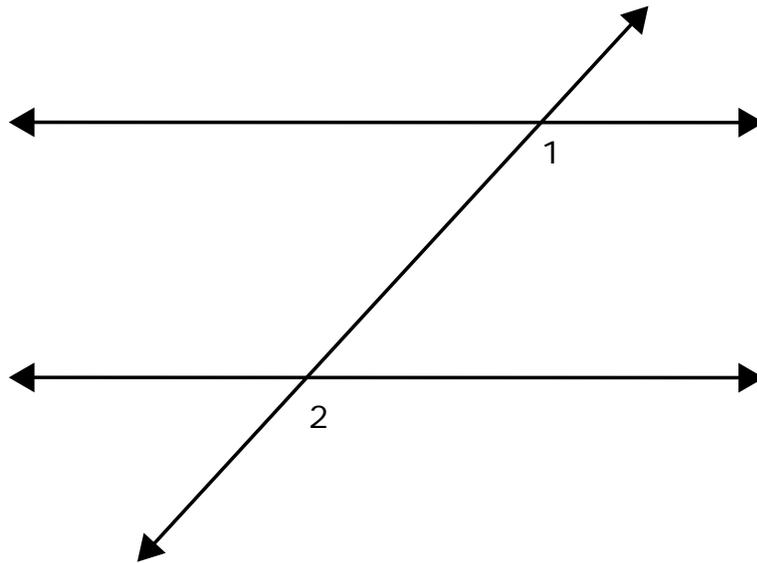
- **The measure of angle 1 is 45 degrees.**

What is the measure of angle 2?

- Ⓐ 35 degrees
- Ⓑ 45 degrees
- Ⓒ 55 degrees

Depth of Knowledge: 1

Correct Answer: A



Which statement about $\angle 1$ and $\angle 2$ is true?

- (A)** They are corresponding angles.
- (B)** They are alternate interior angles.
- (C)** They are alternate exterior angles.

Oklahoma C³ Standard:

Standard 3: Geometry - The student will apply the properties and relationships of plane geometry in a variety of contexts.

Oklahoma C³ Objective:

3. Construct geometric figures and identify geometric transformations on the rectangular coordinate plane (e.g., rotations, translations, reflections, magnifications).

Item Specifications:Emphasis:

- Demonstrate a working knowledge of the location of points on a coordinate plane.
- Demonstrate a working knowledge of geometric transformations of figures.

Stimulus Attributes:

- Test items may include coordinate graphs and geometric transformations of figures including rotations, translations, and reflections.

Format:

- Identify the point located at identified coordinates on a coordinate plane or map.
- Identify a geometric transformation.

Content Limits:

- Limit geometric figures to two dimensions.
- Limit transformations to reflections, rotations, translations, and dilations.
- Coordinate graphs must have increments of one marked on the x-axis and the y-axis.
- Limit the range of values on each axis of the graph to -5 to 5.

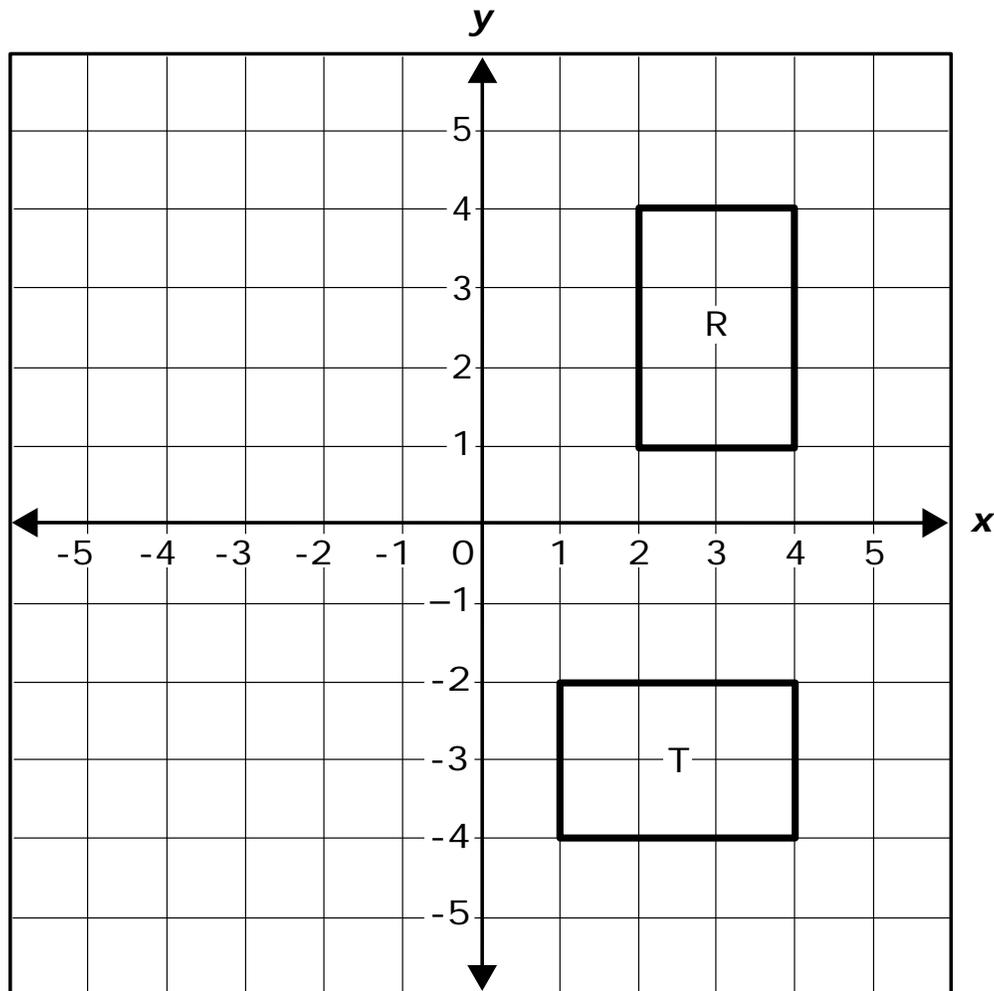
Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules or properties
- Incorrect interpretation of data display

Modified Oklahoma C³ 3.3 Sample Item:

Depth of Knowledge: 1

Correct Answer: B

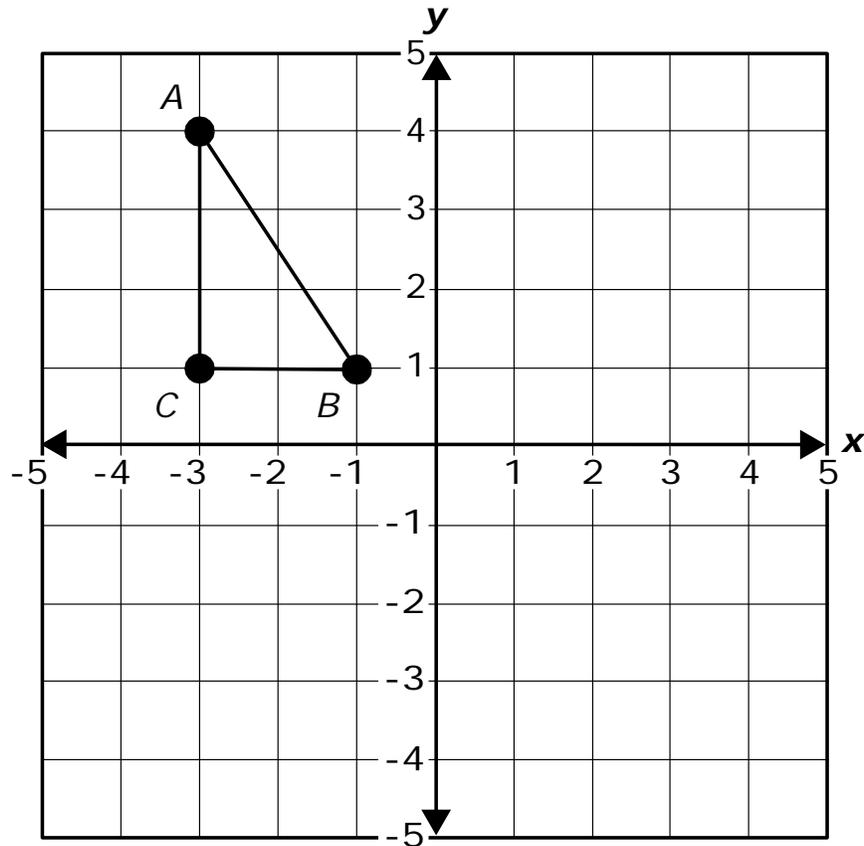


Which term describes the transformation from figure R to figure T?

- (A) reflection
- (B) rotation
- (C) translation

Depth of Knowledge: 3

Correct Answer: B



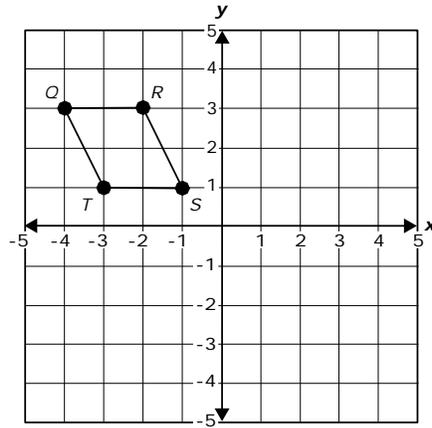
The triangle will be rotated 90° clockwise about the origin. What will be the new coordinates of vertex A?

- (A)** (3, 4)
- (B)** (4, 3)
- (C)** (-4, 3)

Depth of Knowledge: 2

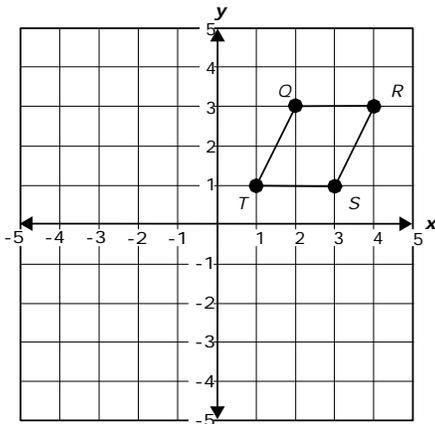
Correct Answer: A

A parallelogram is shown.

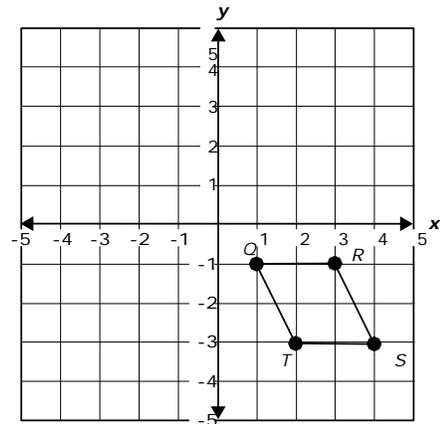


Which coordinate grid shows the position of the parallelogram after it is reflected across the y-axis?

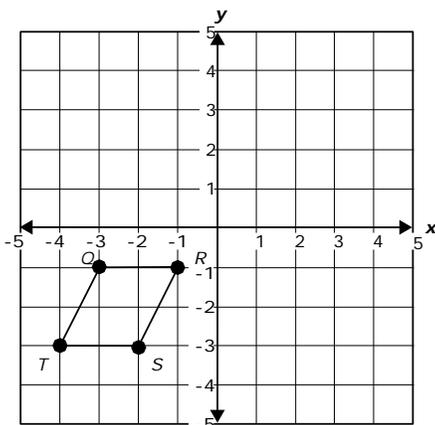
A



B



C



Oklahoma C³ Standard:

Standard 4: Measurement - The student will use measurement to solve problems in a variety of contexts.

Oklahoma C³ Objective:

1. Develop and apply the formulas for perimeter and area of triangles and quadrilaterals to solve problems.

Item Specifications:Emphasis:

- Demonstrate the ability to solve area and perimeter problems involving triangles and quadrilaterals.
- Apply formulas to solve problems involving the perimeter and area of rectangles.

Stimulus Attributes:

- Test items may include illustrations of the following: coordinate graphs, two-dimensional geometric figures, rulers, combined forms, scale drawings, formulas, and other diagrams.

Format:

- Explore the concepts of area and perimeter in mathematical, geometric, and real-world contexts.
- Apply the formulas used to find the area and perimeter of triangles and quadrilaterals in a variety of contexts.
- Formulas may or may not be given.

Content Limits:

- Limit figures to triangles and quadrilaterals or combinations of triangles and quadrilaterals.
- Two-dimensional geometric shapes may be regular or irregular.
- Provide grids for computing the area of combined forms.

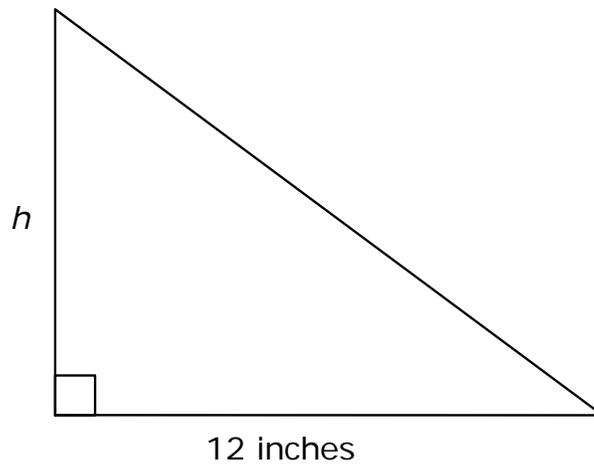
Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules, properties, or formulas
- Use of incorrect formula
- Confusion between area and perimeter

Modified Oklahoma C³ 4.1 Sample Item:

Depth of Knowledge: 2

Correct Answer: B

The area of this triangle is 54 square inches.**What is the height, h , of the triangle?**

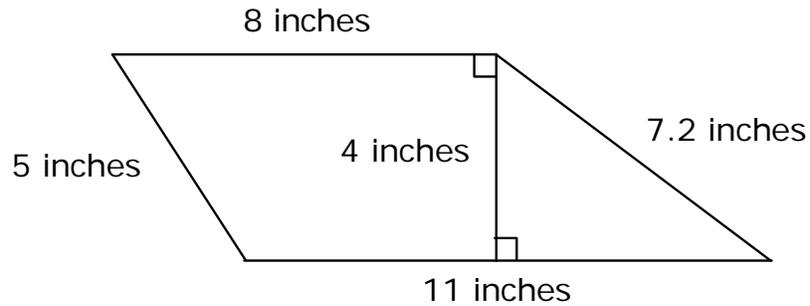
$$A = \frac{1}{2}bh$$

- (A)** 4.6 inches
- (B)** 9 inches
- (C)** 27 inches

Depth of Knowledge: 2

Correct Answer: B

Eli glued a piece of string along the perimeter of this figure.

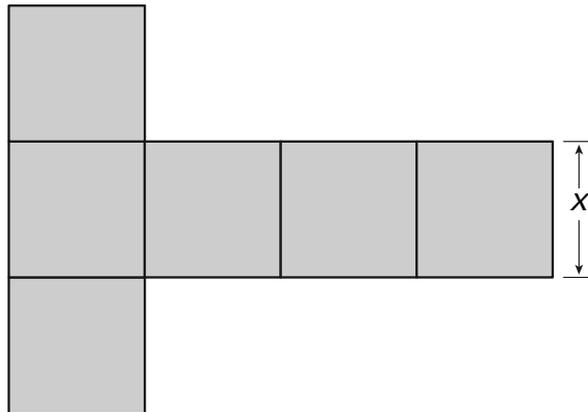


What is the smallest length of string Eli could use?

- (A) 24.2 inches
- (B) 31.2 inches
- (C) 35.2 inches

Depth of Knowledge: 3

Correct Answer: C

Each square is x units long.**Which formula can be used to find n , the combined area of 2 squares?**

- A $n = \frac{1}{6}x^2$
- B $n = x^2$
- C $n = 2x^2$

Oklahoma C³ Standard:

Standard 4: Measurement - The student will use measurement to solve problems in a variety of contexts.

Oklahoma C³ Objective:

2. Apply the formula for the circumference and area of a circle to solve problems.

Item Specifications:Emphasis:

- Demonstrate the ability to solve circumference and area problems involving circles.
- Apply formulas to solve problems involving the circumference and area of circles.

Stimulus Attributes:

- Test items may include illustrations of the following: coordinate graphs, two-dimensional geometric figures, rulers, combined forms, scale drawings, formulas, and other diagrams.

Format:

- Explore the concepts of area and circumference in mathematical, geometric, and real-world contexts.
- Apply the formulas used to find the area and circumference of circles in a variety of contexts.
- Formulas may or may not be given.

Content Limits:

- Provide grids for computing the area of combined forms.
- Limit measurements of radius and diameter to rational numbers.

Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules, properties, or formulas
- Use of incorrect formula
- Confusion between area and circumference

Modified Oklahoma C³ 4.2 Sample Item:

Depth of Knowledge: 2

Correct Answer: B

Maria walked around a circular fountain one time.

- **The radius of the fountain is 10 meters.**

What approximate distance did Maria walk around the fountain?

$$C = 2\pi r$$

- Ⓐ 31 meters
- Ⓑ 63 meters
- Ⓒ 314 meters

Depth of Knowledge: 2

Correct Answer: B

A circular track has a circumference of 200π meters.**What is the radius of the circular track?**

$$C = 2\pi r$$

- Ⓐ 50 meters
- Ⓑ 100 meters
- Ⓒ 200 meters

Depth of Knowledge: 3

Correct Answer: A

David used a string with a piece of chalk tied to one end to draw a circle.

- **He taped one end of the string to the sidewalk.**
- **He drew the circle using the chalk tied to the other end of the string.**
- **The area of the circle is about 113 square inches.**

Which is closest to the length of the string?

$$A = \pi r^2$$

- Ⓐ 6 inches
- Ⓑ 18 inches
- Ⓒ 36 inches

Oklahoma C³ Standard:

Standard 4: Measurement - The student will use measurement to solve problems in a variety of contexts.

Oklahoma C³ Objective:

3. Find the area and perimeter of composite figures to solve application problems.

Item Specifications:Emphasis:

- Identify, select, and apply appropriate formulas.

Stimulus Attributes:

- Test items may include formulas other than geometric formulas.

Format:

- Select and apply appropriate formulas for mathematical and real-world situations.
- Identify new formulas and apply combinations of formulas to determine the area of irregular regions.

Content Limits:

- Limit formulas to those used in real-world situations.
- Limit composite shapes to those made up of squares, triangles, rectangles, and circles.
- Limit multi-step processes to one or two steps for each component stage.

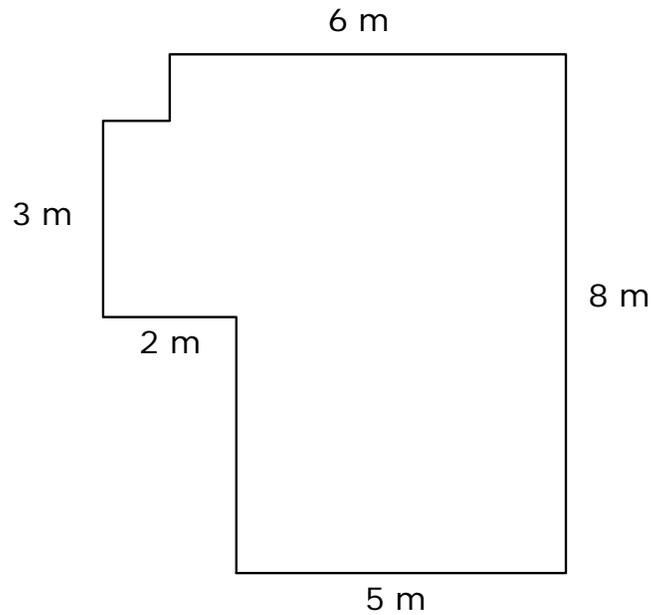
Distractor Domain:

- Common errors
- Use of inappropriate formulas
- Incorrect procedures

Depth of Knowledge: 2

Correct Answer: C

This figure is made from line segments that meet at right angles.



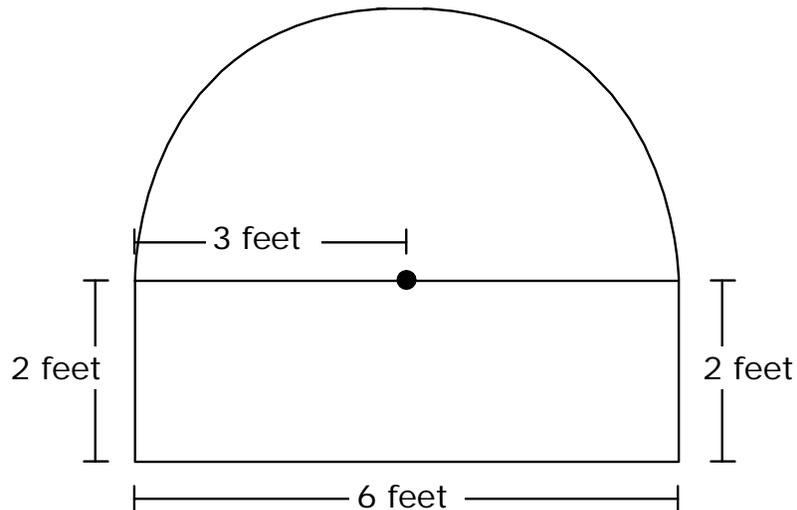
What is the perimeter of the figure in meters (m)?

- A 26 meters
- B 28 meters
- C 30 meters

Depth of Knowledge: 3

Correct Answer: A

This figure is made from a semicircle and a rectangle.



What is the perimeter of this figure?

$$C = 2\pi r$$

- Ⓐ $(10 + 3\pi)$ feet
- Ⓑ $(12 + 9\pi)$ feet
- Ⓒ $(16 + 9\pi)$ feet

Oklahoma C³ Standard:

Standard 5: Data Analysis - The student will use data analysis, probability, and statistics to interpret data in a variety of contexts.

Oklahoma C³ Objective:

1. Data Analysis: Compare, translate, and interpret between displays of data (e.g., multiple sets of data on the same graph, data from subsets of the same population, combinations of diagrams, tables, charts, and graphs).

Item Specifications:Emphasis:

- Demonstrate an understanding of a wide variety of graphing formats for displaying data.

Stimulus Attributes:

- Test items may include graphs of a variety of types, including line plots, bar graphs, stem-and-leaf plots, scatter plots, histograms, and circle graphs.

Format:

- Select and apply graphs to display data.

Content Limits:

- Limit correct graphs to charts, tables, bar graphs, pictographs, line graphs, circle graphs, and Venn diagrams.
- Limit data to age-appropriate situations.

Distractor Domain:

- Common misconceptions
- Incorrectly organized data sets

Modified Oklahoma C³ 5.1 Sample Item:

Depth of Knowledge: 1

Correct Answer: C

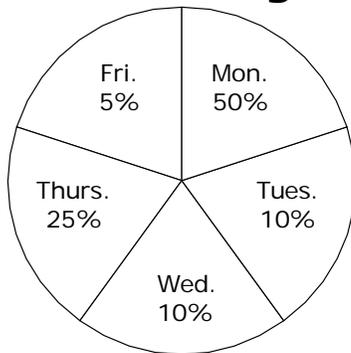
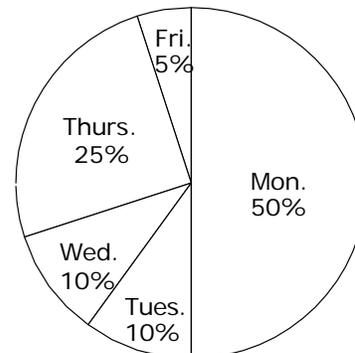
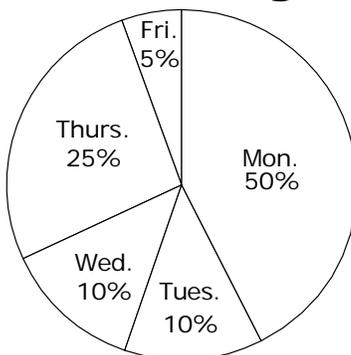
Seventh graders were asked about their favorite night to watch TV.

- **This table shows the results of their survey.**

TV Viewing

Night	Percent Favoring
Monday	50%
Tuesday	10%
Wednesday	10%
Thursday	25%
Friday	5%

Which graph shows the information from the table?

(A) TV Viewing**(B) TV Viewing****(C) TV Viewing**

Depth of Knowledge: 2
 Correct Answer: B

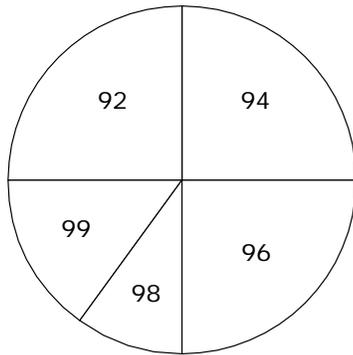
This table shows the high temperatures on school days last September.

High Temperatures

Temperature (F°)	Number of Days
92	8
94	3
96	5
98	1
99	4

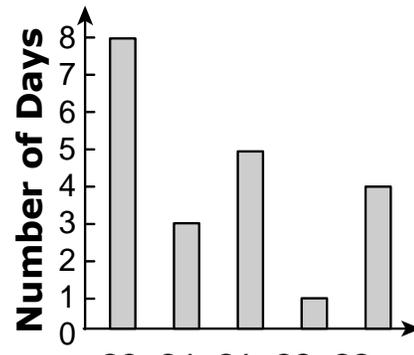
Which graph best shows the data in this table?

(A) High Temperatures



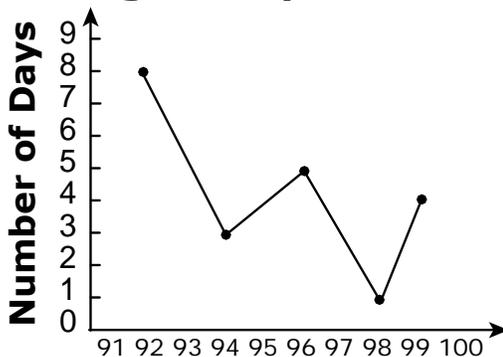
Temperature (°F)

(B) High Temperatures



Temperature (°F)

(C) High Temperatures



Temperature (°F)

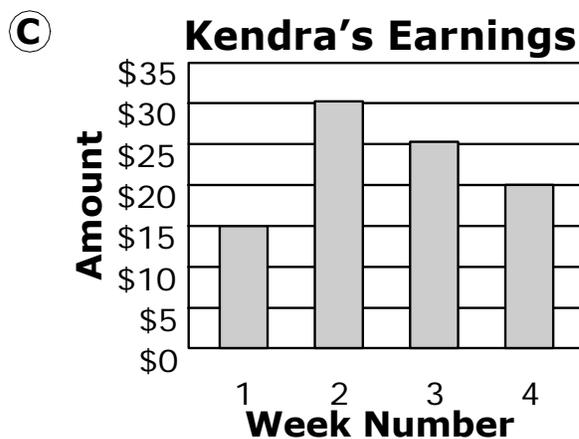
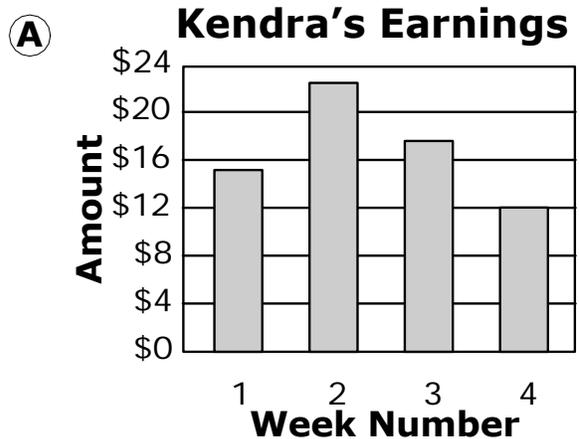
Depth of Knowledge: 2

Correct Answer: A

The amount of pay Kendra earned each week for 4 weeks is listed below.

- \$15 in week 1
- \$22 in week 2
- \$18 in week 3
- \$12 in week 4

Which graph best represents the pay Kendra earned for the 4 weeks?



Oklahoma C³ Standard:

Standard 5: Data Analysis - The student will use data analysis, probability, and statistics to interpret data in a variety of contexts.

Oklahoma C³ Objective:

2. Probability: Determine the probability of an event involving “or,” “and,” or “not” (e.g., on a spinner with one blue, two red, and two yellow sections, what is the probability of getting a red or a yellow?).

Item Specifications:Emphasis:

- Demonstrate the ability to determine the probability of an event involving “not.”
- Demonstrate the ability to predict probabilities in specified mathematical and real-world contexts.

Stimulus Attributes:

- Test items may include illustrations of the following: tables, frequency charts, pictographs, circle graphs, data sets, spinners, and other diagrams, with or without replacement.

Format:

- Predict the probability of the outcome of a specified event or experiment in a mathematical or real-world context based on “not” statements.
- Express probabilities as a fraction.

Content Limits:

- Limit to simple probability experiments.
- Limit the sample to no more than five pieces of data.
- Limit the size of individual data pieces to values less than or equal to 10 (excluding totals).
- Eliminate the need to reduce fractions.
- Limit real-world contexts to age-appropriate situations.

Distractor Domain:

- Common errors
- Incorrect procedures
- Computational errors
- Incorrect use of rules or properties
- Use of incorrect equivalencies

Modified Oklahoma C³ 5.2 Sample Item:

Depth of Knowledge: 2

Correct Answer: C

Norma has a game card with the following statement:**1 out of 7 cards is a winner!****What is the probability that Norma did not receive a winning game card?**

- (A)** $\frac{1}{7}$
- (B)** $\frac{4}{7}$
- (C)** $\frac{6}{7}$

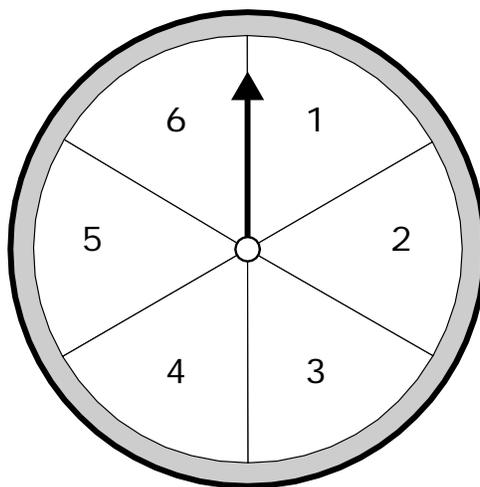
Depth of Knowledge: 2

Correct Answer: B

The prize wheel at the school fair is divided into 6 sections of equal size.

- **The sections are numbered 1 through 6.**
- **A contestant spins the arrow once.**

Prize Wheel



What is the probability that the arrow will not stop on a section labeled with an even number?

- A** $\frac{1}{6}$
- B** $\frac{3}{6}$
- C** $\frac{5}{6}$

Depth of Knowledge: 3

Correct Answer: B

A teacher has a bag containing green, red, and yellow marbles.

- **All of the marbles are the same size.**
- **The teacher draws one marble from the bag.**
- **The probability of not drawing a yellow marble is $\frac{7}{10}$.**

How many green and red marbles could be in the bag?

- Ⓐ 3
- Ⓑ 7
- Ⓒ 10

Oklahoma C³ Standard:

Standard 5: Data Analysis - The student will use data analysis, probability, and statistics to interpret data in a variety of contexts.

Oklahoma C³ Objective:

3. Central Tendency: Compute the mean, median, mode, and range for data sets and understand how additional data or outliers in a set may affect the measures of central tendency.

Item Specifications:Emphasis:

- Find the measures of central tendency (mean, median, mode, and range) of a set of data.
- Demonstrate an understanding of the mean, median, mode, and range.

Stimulus Attributes:

- Test items may include illustrations of the following: charts, tables, graphs, and data sets.

Format:

- Find the measures of central tendency in a given context.
- Identify how measures of central tendency are affected by a change in a set of data.
- Identify why a specific measure provides the most useful information in a given context.
- Analyze the appropriate use of the mean in comparison with other measures of central tendency.

Content Limits:

- Limit data sets to no more than 10 data points.

Distractor Domain:

- Common errors
- Incorrect procedures
- Use of median or mode in place of mean

Modified Oklahoma C³ 5.3 Sample Item:

Depth of Knowledge: 2

Correct Answer: A

Eight homework scores are listed.**75, 87, 0, 84, 74, 85, 74, 81****What is the median of these homework scores?**

- A 78
- B 80
- C 81

Depth of Knowledge: 2

Correct Answer: C

Which data set has a median greater than the mode?

- A 10, 7, 5, 3, 10
- B 26, 31, 28, 26, 22
- C 16, 12, 21, 12, 14

Depth of Knowledge: 2

Correct Answer: B

18, 22, 20, 17, 28

How is the mean affected when the number 21 is added to this set of data?

- Ⓐ The mean increases by 1.
- Ⓑ The mean remains the same.
- Ⓒ The mean decreases by 1.