ACTAAP

Arkansas Comprehensive Testing, Assessment, and Accountability Program

Released Item Booklet

Geometry Mid-Year End-of-Course Examination

January 2010 Administration

Arkansas Department of Education

Table of Contents

PART I Overview

The criterion-referenced tests implemented as part of the **Arkansas Comprehensive Testing, Assessment, and Accountability Program** (ACTAAP) are being developed in response to Arkansas Legislative Act 35, which requires the State Board of Education to develop a comprehensive testing program that includes assessment of the challenging academic content standards defined by the Arkansas Curriculum Frameworks.

As part of this program, students in Arkansas public schools who had completed or were completing Geometry by the end of the first semester participated in the *Geometry Mid-Year End-of-Course Examination* in January 2010.

This Released Item Booklet for the *Geometry Mid-Year End-of-Course Examination* contains test questions or items that were asked of students during the January 2010 operational administration. The test items included in Part II of this booklet are some of the items that contributed to the student performance results for that administration.

Students were given approximately an hour and a half each day to complete assigned test sessions during the two days of testing in January 2010. Students were permitted to use a calculator for both multiple-choice and open-response items. Students were also supplied with a reference sheet to be used so that all students would have equal access to this information during testing. (See the reference sheet on page 15 of this booklet.) All of the multiple-choice items within this booklet have the correct response marked with an asterisk (*).

The development of the *Geometry Mid-Year End-of-Course Examination* was based on the *Arkansas Geometry Mathematics Curriculum Framework*. This framework has distinct levels: Strands to be taught in concert, Content Standards within each Strand, and Student Learning Expectations within each Content Standard. An abridged version of the *Arkansas Geometry Mathematics Curriculum Framework* can be found in Part III of this booklet. It is important to note that this abridged version lists only the predominant Strand, Content Standard, and Student Learning Expectation associated with each item. However, since many key concepts within the *Arkansas Geometry Mathematics Curriculum Framework* are interrelated, in many cases there are other item correlations or associations across Strands, Content Standards, and Student Learning Expectations.

Part IV of the Released Item Booklet contains a tabular listing of the Strand, Content Standard, and Student Learning Expectation that each question was designed to assess. The multiple-choice and open-response items found on the *Geometry Mid-Year End-of-Course Examination* were developed in close association with the Arkansas education community. Arkansas teachers participated as members of the Geometry Content Advisory Committee, providing routine feedback and recommendations for all items. The number of items associated with specific Strands, Content Standards, and Student Learning Expectations was based on approximate proportions suggested by the Content Advisory Committee, and their recommendations were accommodated to the greatest extent possible given the overall test design. Part IV of the Released Item Booklet provides Arkansas educators with specific information on how the *Geometry Mid-Year End-of-Course Examination* items align or correlate with the *Arkansas Geometry Mathematics Curriculum Framework* to provide models for classroom instruction.

PART I Scoring Student Responses to Geometry Open-Response Items

While multiple-choice items are scored by machine to determine if the student chose the correct answer from four options, responses to open-response items must be scored by trained "readers" using a pre-established set of scoring criteria.

The Arkansas Geometry Rangefinding Committee assisted in the development of the scoring criteria. The committee comprises active, Arkansas educators with expertise in mathematics education.

Reader Training

Before readers are allowed to begin assigning scores to any student responses, they go through intensive training. The first step in that training is for the readers to read the Geometry open-response items as they appear in the test booklet and to respond—just as the student test takers are required to do. This step gives the readers some insight into how the students might have responded. The next step is the readers' introduction to the scoring rubric. All of the specific requirements of the rubric are explained by the Scoring Director who has been specifically trained to lead the scoring group. Then responses (anchor papers) that illustrate the score points of the rubric are presented to the readers and discussed. The goal of this discussion is for the readers to understand why a particular response (or type of response) receives a particular score. After discussion of the rubric and anchor papers, readers practice scoring sets of responses that have been pre-scored and selected for use as training papers. Detailed discussion of the responses and the scores they receive follows.

After three or four of these practice sets, readers are given "qualifying rounds." These are additional sets of pre-scored papers, and, in order to qualify, each reader must score in exact agreement on at least 80% of the responses and have no more than 5% non-adjacent agreement on the responses. Readers who do not score within the required rate of agreement are not allowed to score the *Geometry Mid-Year End-of-Course Examination* responses.

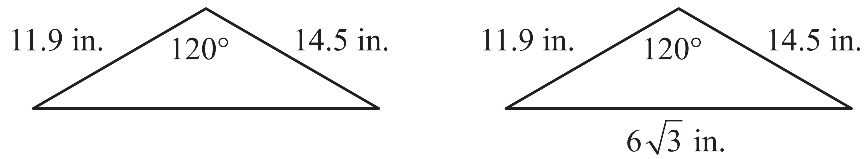
Once scoring of the actual student responses begins, readers are monitored constantly throughout the project to ensure that they are scoring according to the criteria. Daily and cumulative statistics are posted and analyzed, and Scoring Directors or Team Leaders reread selected responses scored by the readers. These procedures promote reliable and consistent scoring. Any reader who does not maintain an acceptable level of agreement is dismissed from the project.

Scoring Procedures

All student responses to the *Geometry Mid-Year End-of-Course Examination* open-response test items are scored independently by two readers. Those two scores are compared, and responses that receive scores that are non-adjacent (a "1" and a "3," for example) are scored a third time by a Team Leader or the Scoring Director for resolution.

PART II Released Geometry Items

1. Irma wants to show that the two triangles below are congruent.



Based on only the information given, which theorem proves that the two triangles are congruent?

A. AAS
B. ASA
*C. SAS
D. SSS

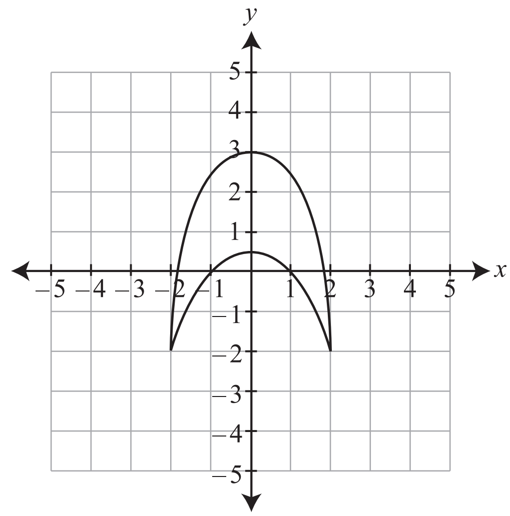
2. Aisha is creating a mold to make candles. She wants to make candles cylindrical in shape, with a diameter of 10 centimeters and a height of 20 centimeters. What will be the surface area of each candle? Round your answer to the nearest whole number.

A. 471 cm^2
B. 628 cm^2
C. 707 cm^2
*D. 785 cm^2

3. A brownie recipe uses a 13-inch by 9-inch pan. Lily measures the height of her pan as 3 inches. How much brownie mixture would be required to fill the pan?

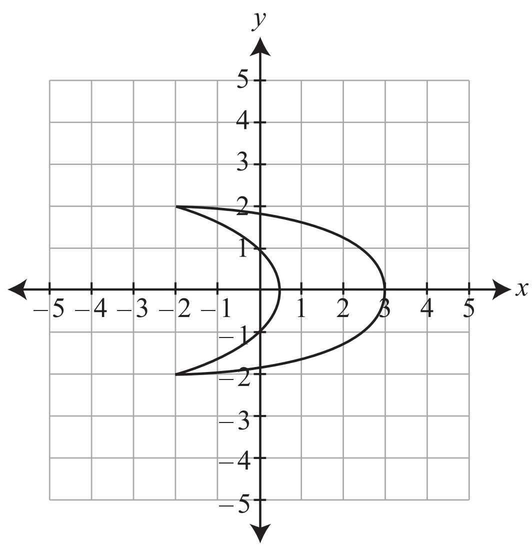
A. 66 cubic inches
B. 117 cubic inches
C. 156 cubic inches
*D. 351 cubic inches

4. The figure below is rotated 90° clockwise about the origin, then reflected across the y-axis.

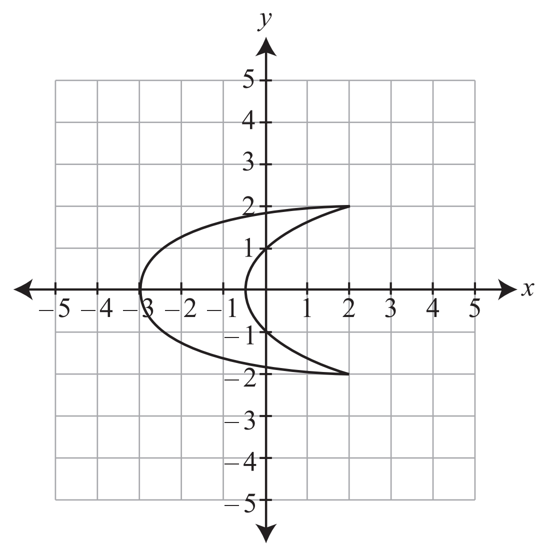


What is the final figure?

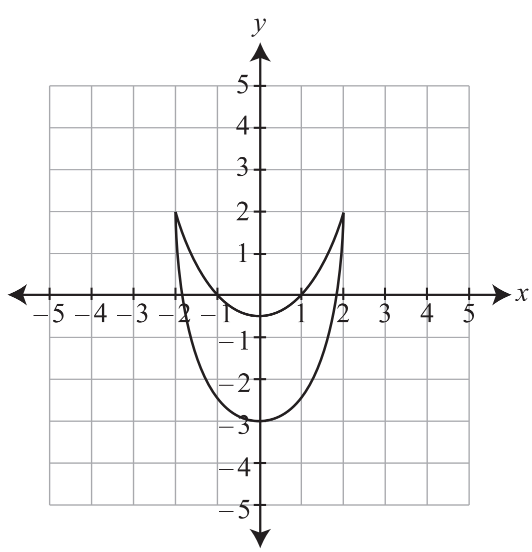
A.



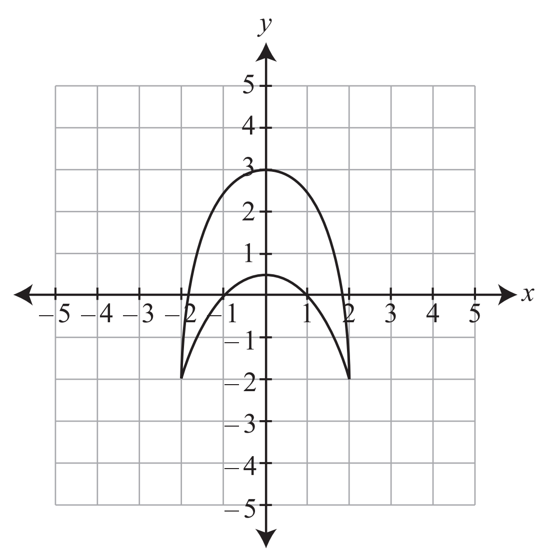
*B.



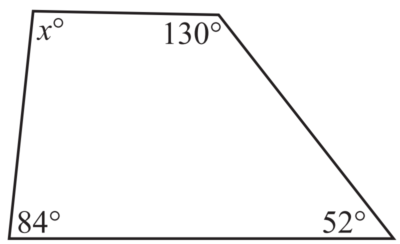
C.



D.



5. Thorsten builds model airplanes. The design for the tail fin of one of his models is shown in the figure below.



What is the value of x?

A. 50
B. 86
*C. 94
D. 98

6. The sum of the measures of the interior angles of a regular polygon is 540°. Which type of polygon is this?

A. hexagon
*B. pentagon
C. square
D. triangle

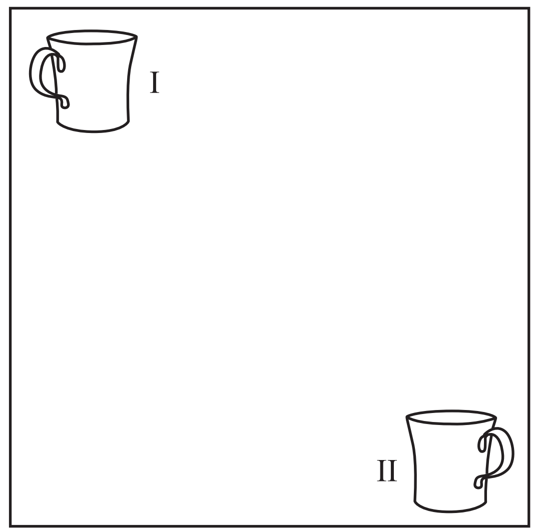
7. Line FG has a slope of 3. Which is the equation of a line that is perpendicular to line FG?

*A. $y = -\frac{1}{3}x + 2$
B. $y = -3x - 5$
C. $y = \frac{1}{3}x - 5$
D. $y = 3x - 4$

8. What is the equation of a circle with a radius of 9 and a center point of (–2, 3)?

A. $(x + 4)^2 + (y - 9)^2 = 81$
B. $(x + 2)^2 - (y - 3)^2 = 81$
*C. $(x + 2)^2 + (y - 3)^2 = 81$
D. $(x - 2)^2 + (y + 3)^2 = 81$

Use the figure below to answer question 9.



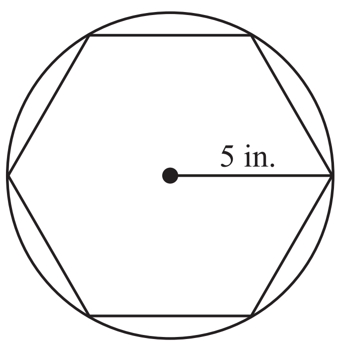
9. Roberto is a computer graphics designer and is working on an ad for the local coffee shop. The figure above shows a coffee mug in two different positions. Which describes the transformation of the coffee mug in position I to the image in position II?

A. a reflection over a horizontal line and a translation down
*B. translation down and a reflection over a vertical line
C. 180° rotation
D. translation to the right and a reflection over a vertical line

10. Patricia is constructing 2 similar boxes of different sizes. The perimeter of the front of the smaller box is 38 inches. The perimeter of the front of the larger box is 57 inches. The width of the smaller box is 6 inches. What is the width of the larger box?

A. 4 inches
*B. 9 inches
C. 19 inches
D. 25 inches

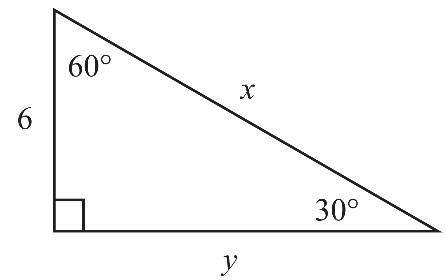
11. A regular hexagon has been inscribed in a circle having the radius shown below.



What is the perimeter of the hexagon?

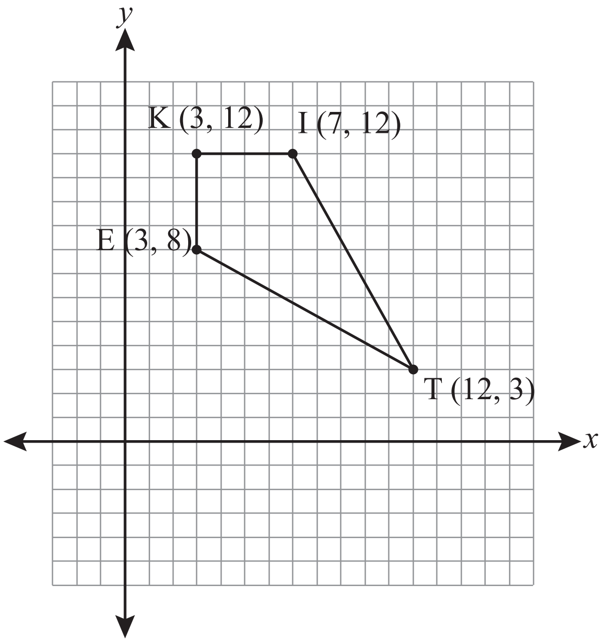
A. 21.2 in.
B. 26.0 in.
*C. 30.0 in.
D. 31.4 in.

12. What are the values for x and y in the figure below?



A. $x = 12, y = 6\sqrt{2}$
*B. $x = 12, y = 6\sqrt{3}$
C. $x = 6\sqrt{2}, y = 6$
D. $x = 6\sqrt{3}, y = 12$

Use the graph below to answer question 13.



13. A kite is designed for an upcoming craft show. In order to get the design lined up properly, point S must be located. Point S is the midpoint of $\overline{EI}$. What are the coordinates of point S?

A. (2, 2)

*B. (5, 10)

C. $(5\frac{1}{2}, 9\frac{1}{2})$

D. $(7\frac{1}{2}, 7\frac{1}{2})$

14. A map has a scale of 1.3 inches = 18 miles. Two cities are 125 miles apart. How many inches are between these two cities on the map? Round your answer to the nearest tenth.

A. 5.3 inches

B. 6.5 inches

C. 7.5 inches

*D. 9.0 inches

15. In her science class, Jane learns that the statements below are true.

- All metals are elements.
- No vitamins are elements.

Using deductive reasoning, what can Jane conclude?

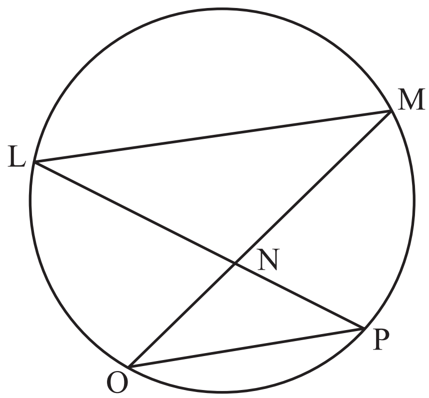
*A. No vitamins are metals.

B. All metals are vitamins.

C. Some vitamins are metals.

D. Some elements are vitamins.

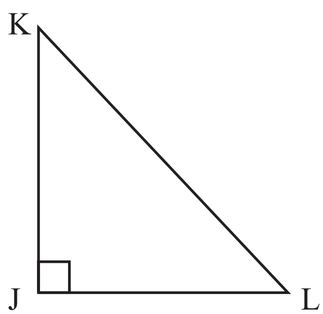
16. In the figure below, m∠MLP = 35°.



What is m∠MOP?

*A. 35°
B. 70°
C. 125°
D. 145°

17. In the triangle below, what is sin(L)?



A. $\frac{JK}{JL}$

*B. $\frac{JK}{KL}$

C. $\frac{JL}{JK}$

D. $\frac{JL}{KL}$

18. A circle has the equation below.

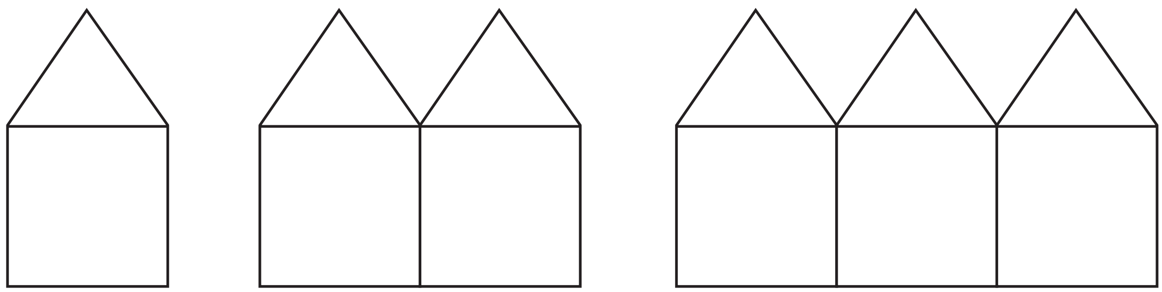
$$(x + 3)^2 + (y - 2)^2 = 16$$

What are the coordinates of its center?

*A. (–3, 2)
B. (–2, 3)
C. (2, –3)
D. (3, –2)

PART II Released Geometry Items

19. A square and an equilateral triangle form the figure in Stage 1. These figures are then placed side by side to form the pattern below.



Perimeter = 5 inches
Stage 1

Perimeter = 8 inches
Stage 2

Perimeter = 11 inches
Stage 3

If each side of the square has a measure of 1 inch, what is the perimeter of the figure formed in Stage 6?

*A. 20 inches
B. 23 inches
C. 26 inches
D. 30 inches

20. Each class in a high school wore a different color for spirit day. The colors were blue, red, green, and yellow.

- The sophomore class did not wear yellow.
- The senior class did not wear yellow or green.
- The junior class wore blue.
- The freshman class wore either yellow or red.

Based on the above statements, which class wore green?

A. junior
B. senior
C. freshman
*D. sophomore

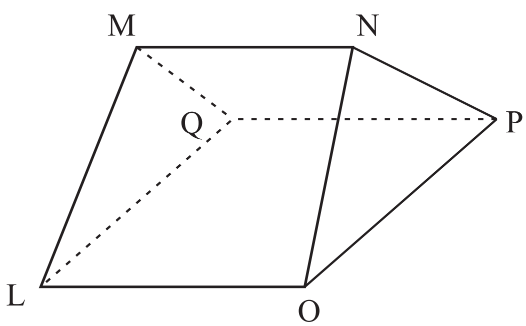
21. A shipping company sells cylindrical boxes to ship items. The smallest box they offer has a height of 8 inches and a radius of 6 inches. The next larger box has the same radius as the smallest, but its height is 16 inches. How much does the volume change between the two cylinder sizes?

*A. The volume of the larger cylinder is 2 times the volume of the smaller cylinder.
B. The volume of the larger cylinder is 4 times the volume of the smaller cylinder.
C. The volume of the larger cylinder is 8 times the volume of the smaller cylinder.
D. The volume of the larger cylinder is 16 times the volume of the smaller cylinder.

22. A student has metal rods of different lengths. Which set of rods can be arranged to form a triangle?

A. 4 cm, 6 cm, 12 cm
B. 4 cm, 12 cm, 20 cm
C. 6 cm, 10 cm, 20 cm
*D. 6 cm, 12 cm, 14 cm

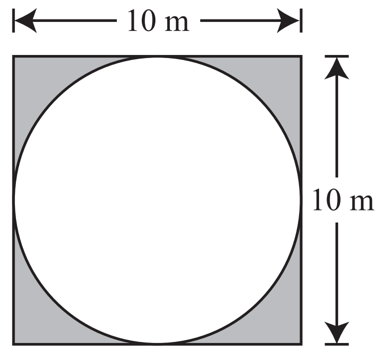
23. The figure below shows a triangular prism.



Which is true?

A. $\overline{MN} \parallel \overline{OP}$
B. $\overline{LM} \parallel \overline{NP}$
*C. $\overline{MN} \parallel \overline{PQ}$
D. $\overline{LQ} \parallel \overline{NP}$

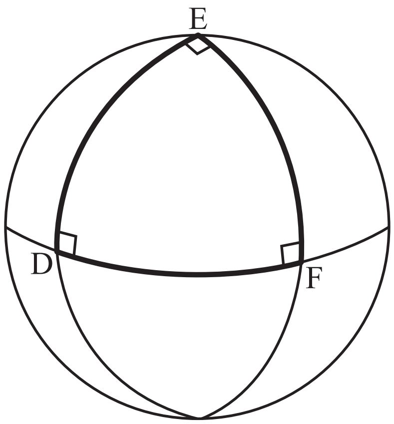
24. A square courtyard has the design shown below.



Wind blows a feather into the courtyard. What is the probability that the feather lands in the shaded area? Round your answer to the nearest tenth of a percent.

A. 5.4%
B. 8.0%
C. 10.8%
*D. 21.5%

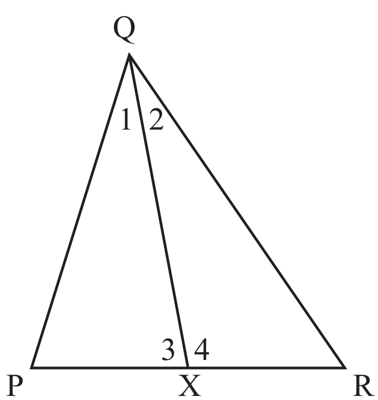
25. Smita draws three lines on a sphere. The three lines intersect each other at right angles to make ΔDEF, as shown below.



In ΔDEF, ED = EF = 8.2 inches. What is DF?

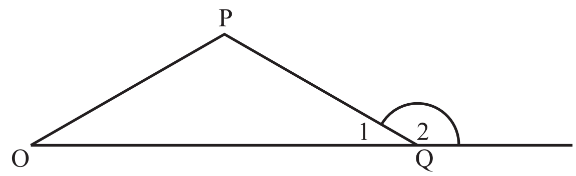
A. 5.8 inches
*B. 8.2 inches
C. 11.6 inches
D. 12.3 inches

26. In ΔPQR below, $\overline{QX}$ is a median. Which must be true?



*A. PX = XR
B. PQ = QR
C. ∠1 ≅ ∠2
D. ∠3 ≅ ∠4

27. In the figure below, which represents the roof of a house, m∠1 = $(x + 4)°$ and m∠2 = $(5x + 20)°$.



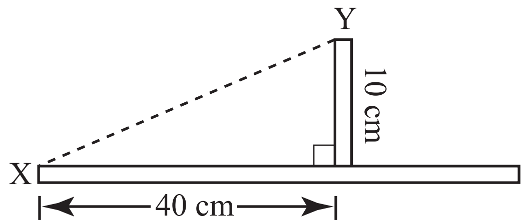
What is m∠2?

A. 30°
B. 75°
C. 100°
*D. 150°

28. What is the equation of the line that passes through point (–3, –1) and is perpendicular to the line with equation $y = -\frac{1}{3}x + 5$?

A. $y = -3x - 10$
B. $y = -\frac{1}{3}x - 2$
*C. $y = 3x + 8$
D. $y = \frac{1}{3}x$

29. A student is making a model of a suspension bridge. A sketch of the model is shown below.



What length of wire should be cut to stretch from X to Y? Round your answer to the nearest tenth.

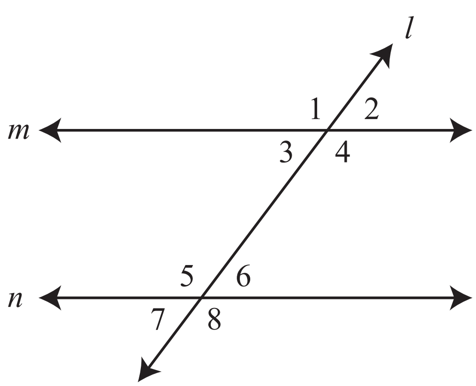
A. 30.0 cm

B. 38.7 cm

*C. 41.2 cm

D. 50.0 cm

30. Which is sufficient to prove that lines *m* and *n* are parallel?



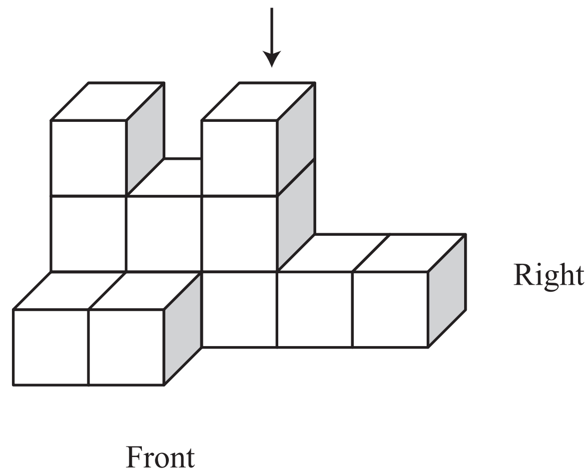
*A. $m\angle 3 = m\angle 6$

B. $m\angle 5 = m\angle 8$

C. $m\angle 3 + m\angle 4 = 180$

D. $m\angle 4 + m\angle 2 = 180$

31. A model of a building has been constructed using 12 cubes, as shown below. Another cube is to be added where the arrow is pointing.



Which view will remain the same after the cube is added?

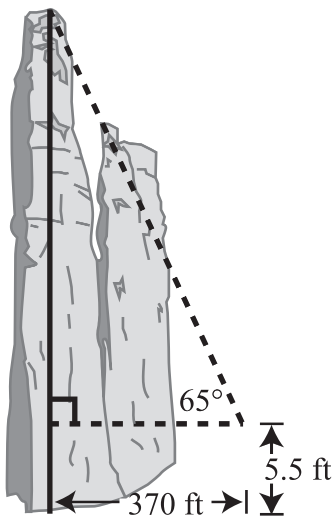
*A. top view

B. front view

C. back view

D. left-side view

32. Spider Rock is located in Canyon de Chelly National Park in Arizona. A surveyor stands 370 feet from the base of Spider Rock. From a point 5.5 feet above the ground, he measures the angle of elevation to the top of Spider Rock to be 65°.



According to the surveyor's measurements, what is the height of Spider Rock? Round your answer to the nearest tenth.

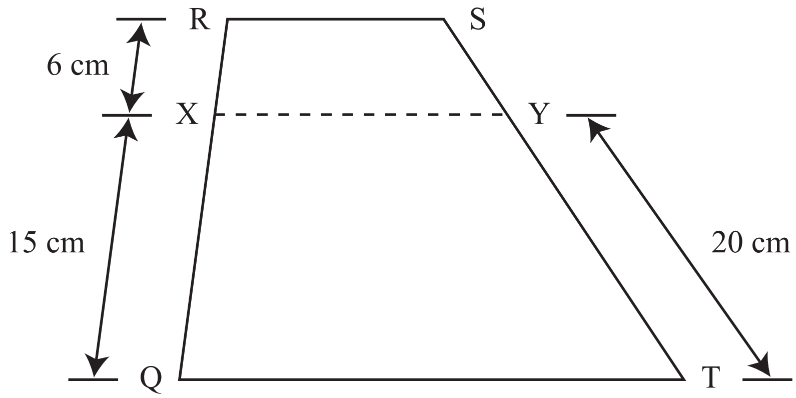
A. 178.0 ft

B. 340.8 ft

C. 413.7 ft

*D. 799.0 ft

33. John drew trapezoid QRST shown below with QX = 15 cm, XR = 6 cm, and TY = 20 cm.

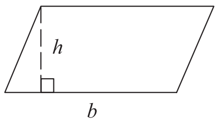


John then cut off the top along dotted line $\overline{XY}$, parallel to $\overline{QT}$. What is SY?

A. 4.5 cm
*B. 8.0 cm
C. 8.5 cm
D. 11.0 cm

End-of-Course Mathematics Reference Sheet

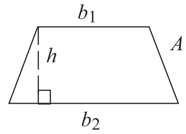
Parallelogram



$P =$ sum of all sides

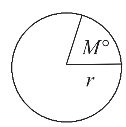
$A = bh$

Trapezoid



$A = \dfrac{h(b_1 + b_2)}{2}$

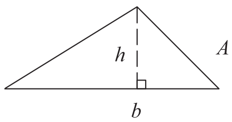
Arc and Sector



Arc Length = $\left(\dfrac{M}{360}\right) \times 2\pi r$

Sector area = $\left(\dfrac{M}{360}\right) \times \pi r^2$

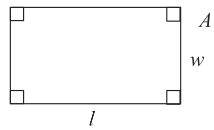
Triangle



$P =$ sum of all sides

$A = \dfrac{bh}{2}$

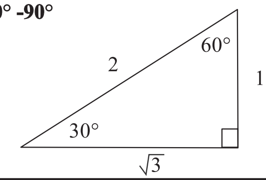
Rectangle



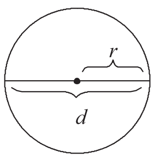
$P = 2l + 2w$

$A = lw$

30° -60° -90°



Circle



$C = 2\pi r$

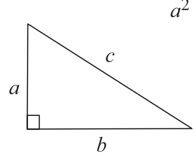
$C = \pi d$

$A = \pi r^2$

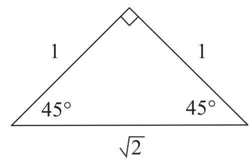
$\pi \approx 3.14$

Pythagorean Theorem

$a^2 + b^2 = c^2$

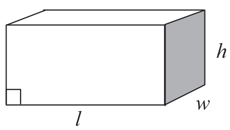


45° -45° -90°



Rectangular Solid

Volume $= lwh$

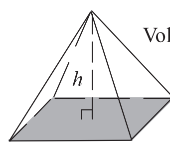


Surface area $= 2lw + 2lh + 2wh$

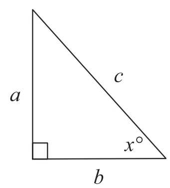
Pyramid

$B =$ *area of base (shaded)*

Volume $= \dfrac{Bh}{3}$



Trigonometric Ratios

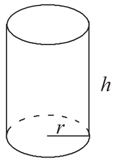


$\sin x° = \dfrac{a}{c}$

$\cos x° = \dfrac{b}{c}$

$\tan x° = \dfrac{a}{b}$

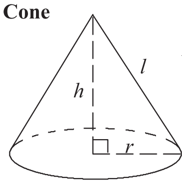
Cylinder



Volume $= \pi r^2 h$

Surface area $= 2\pi rh + 2\pi r^2$

Cone

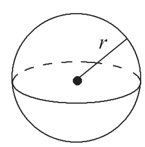


$l =$ slant height

Volume $= \dfrac{\pi r^2 h}{3}$

Surface area $= \pi rl + \pi r^2$

Sphere



Volume $= \dfrac{4\pi r^3}{3}$

Surface area $= 4\pi r^2$

Miscellaneous Formulas

Area of an equilateral triangle	$A = \dfrac{s^2\sqrt{3}}{4}$ s = length of a side
Distance	rate × time
Interest	principal × rate × time in years
Sum of the angles of a polygon having n sides	$(n - 2)180°$
Distance between points on a coordinate plane	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Midpoint	$\left(\dfrac{x_2 + x_1}{2}, \dfrac{y_2 + y_1}{2}\right)$
Slope of a nonvertical line (where $x_2 \neq x_1$)	$m = \dfrac{y_2 - y_1}{x_2 - x_1}$
Slope intercept (where m = slope, b = intercept)	$y = mx + b$
Last term of an arithmetic series Last term of a geometric series (where $n \geq 1$)	$a_n = a + (n - 1)d$ $a_n = ar^{n-1}$
Quadratic formula	$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Area of a square	$A = s^2$
Volume of a cube	$V = s^3$
Area of a regular polygon	$A = \frac{1}{2}ap$ a = apothem, p = perimeter

PART III Curriculum Framework

The Arkansas Geometry Mathematics Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
1. Language of Geometry (LG)	1. Students will develop the language of geometry including specialized vocabulary, reasoning, and application of theorems, properties, and postulates.	1. Define, compare, and contrast inductive reasoning and deductive reasoning for making predictions based on real-world situations. • Venn diagrams • matrix logic • conditional statements (statement, inverse, converse, and contrapositive) • figural patterns 2. Represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays, and angles. 3. Describe relationships derived from geometric figures or figural patterns. 4. Apply, with and without appropriate technology, definitions, theorems, properties, and postulates related to such topics as complementary, supplementary, vertical angles, linear pairs, and angles formed by perpendicular lines. 5. Explore, with and without proper technology, the relationship between angles formed by two lines cut by a transversal to justify when lines are parallel. 6. Give justification for conclusions reached by deductive reasoning. State and prove key basic theorems in geometry (i.e., the Pythagorean theorem, the sum of the measures of the angles of a triangle is 180°, and the line joining the midpoints of two sides of a triangle is parallel to the third side and half its length).
2. Triangles (T)	2. Students will identify and describe types of triangles and their special segments. They will use logic to apply the properties of congruence, similarity, and inequalities. The students will apply the Pythagorean Theorem and trigonometric ratios to solve problems in real-world situations.	1. Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures, and provide logical justification. 2. Investigate the measures of segments to determine the existence of triangles (triangle inequality theorem). 3. Identify and use the special segments of triangles (altitude, median, angle bisector, perpendicular bisector, and midsegment) to solve problems. 4. Apply the Pythagorean Theorem and its converse in solving practical problems. 5. Use the special right triangle relationships (30°-60°-90° and 45°-45°-90°) to solve problems. 6. Use trigonometric ratios (sine, cosine, tangent) to determine lengths of sides and measures of angles in right triangles, including angles of elevation and angles of depression. 7. Use similarity of right triangles to express the sine, cosine, and tangent of an angle, in a right triangle, as a ratio of given lengths of sides.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the January 2010 Mid-Year End-of-Course Geometry Examination.

PART III Curriculum Framework

The Arkansas Geometry Mathematics Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
3. Measurement (M)	3. Students will measure and compare, while using appropriate formulas, tools, and technology, to solve problems dealing with length, perimeter, area, and volume.	1. Calculate probabilities arising in geometric contexts. Ex. Find the probability of hitting a particular ring on a dartboard. 2. Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, and spheres, as well as composite figures, expressing solutions in both exact and approximate forms. 3. Relate changes in the measurement of one attribute of an object to changes in other attributes. Ex. How does changing the radius or height of a cylinder affect its surface area or volume? 4. Use (given similar geometric objects) proportional reasoning to solve practical problems (including scale drawings). 5. Identify and apply properties of, and theorems about, parallel and perpendicular lines to prove other theorems and perform basic Euclidean constructions.
4. Relationships between Two- and Three-dimensions (R)	4. Students will analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.	1. Explore and verify the properties of quadrilaterals. 2. Solve problems using properties of polygons. • sum of the measures of the interior angles of a polygon • interior and exterior angle measure of a regular polygon or irregular polygon • number of sides or angles of a polygon 3. Identify and explain why figures tessellate. 4. Identify the attributes of the five Platonic Solids. 5. Investigate and use the properties of angles (central and inscribed), arcs, chords, tangents, and secants to solve problems involving circles. 6. Solve problems using inscribed and circumscribed figures. 7. Use orthographic drawings (top, front, side) and isometric drawings (corner) to represent three-dimensional objects. 8. Draw, examine, and classify cross-sections of three-dimensional objects. 9. Explore non-Euclidean geometries, such as spherical geometry, and identify its unique properties which result from a change in the parallel postulate.
5. Coordinate Geometry and Transformations (CGT)	5. Students will specify locations, apply transformations, and describe relationships using coordinate geometry.	1. Use coordinate geometry to find the distance between two points, the midpoint of a segment, and the slopes of parallel, perpendicular, horizontal, and vertical lines. 2. Write the equation of a line parallel to a line through a given point not on the line. 3. Write the equation of a line perpendicular to a line through a given point. 4. Write the equation of the perpendicular bisector of a line segment. 5. Determine, given a set of points, the type of figure based on its properties (parallelogram, isosceles triangle, trapezoid). 6. Write, in standard form, the equation of a circle, given a graph on a coordinate plane or the center and radius of a circle. 7. Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane. • translations • reflections • rotations (90°, 180°, clockwise and counterclockwise about the origin) • dilations (scale factor)

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the January 2010 Mid-Year End-of-Course Geometry Examination

PART IV Item Correlation with Curriculum Framework

Released Items for Geometry*

Strands	Content Standards
1— Language of Geometry (LG)	1. Students will develop the language of geometry including specialized vocabulary, reasoning, and application of theorems, properties, and postulates.
2— Triangles (T)	2. Students will identify and describe types of triangles and their special segments. They will use logic to apply the properties of congruence, similarity, and inequalities. The students will apply the Pythagorean Theorem and trigonometric ratios to solve problems in real-world situations.
3— Measurement (M)	3. Students will measure and compare, while using appropriate formulas, tools, and technology, to solve problems dealing with length, perimeter, area, and volume.
4— Relationships between Two- and Three-dimensions (R)	4. Students will analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.
5— Coordinate Geometry and Transformations (CGT)	5. Students will specify locations, apply transformations, and describe relationships using coordinate geometry.

Item	Strand	Content Standard	Student Learning Expectation
1	T	02	01
2	M	03	02
3	M	03	02
4	CGT	05	07
5	R	04	01
6	R	04	02
7	CGT	05	02
8	CGT	05	04
9	CGT	05	05
10	M	03	04
11	R	04	06
12	T	02	05
13	CGT	05	01
14	M	03	04
15	LG	01	06
16	R	04	05
17	T	02	07
18	CGT	05	06
19	LG	01	03
20	LG	01	01
21	M	03	03
22	T	02	02
23	LG	01	02
24	M	03	01
25	R	04	09
26	T	02	03
27	LG	01	04
28	CGT	05	03
29	T	02	04
30	LG	01	05
31	R	04	07
32	T	02	06
33	M	03	05

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Geometry items.

Non-Released Items for Geometry*

Strands	Content Standards
1— Language of Geometry (LG)	1. Students will develop the language of geometry including specialized vocabulary, reasoning, and application of theorems, properties, and postulates.
2— Triangles (T)	2. Students will identify and describe types of triangles and their special segments. They will use logic to apply the properties of congruence, similarity, and inequalities. The students will apply the Pythagorean Theorem and trigonometric ratios to solve problems in real-world situations.
3— Measurement (M)	3. Students will measure and compare, while using appropriate formulas, tools, and technology, to solve problems dealing with length, perimeter, area, and volume.
4— Relationships between Two- and Three-dimensions (R)	4. Students will analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.
5— Coordinate Geometry and Transformations (CGT)	5. Students will specify locations, apply transformations, and describe relationships using coordinate geometry.

Item	Strand	Content Standard	Student Learning Expectation
1	CGT	05	01
2	LG	01	03
3	LG	01	01
4	T	02	05
5	LG	01	04
6	M	03	03
7	LG	01	05
8	T	02	03
9	R	04	08
10	M	03	05
11	R	04	05
12	CGT	05	07
13	T	02	02
14	CGT	05	03
15	LG	01	02
16	M	03	02
17	R	04	07
18	T	02	04
19	R	04	03
20	CGT	05	02
21	R	04	04
22	M	03	01
23	CGT	05	05
24	M	03	04
25	LG	01	06
26	R	04	01
27	T	02	01
A	R	04	07
B	T	02	04
C	M	03	01
D	LG	01	01
E	CGT	05	04

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Geometry items.

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