



Arkansas Comprehensive Testing, Assessment, and Accountability Program

Released Item Booklet

Geometry

End-of-Course Examinations

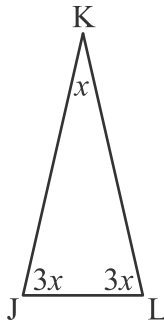
January and April 2009 Administrations

This document is the property of the Arkansas Department of Education, and all rights of this document are reserved by the Arkansas Department of Education. Arkansas public schools may reproduce this document in full or in part for use with teachers, students, and parents. All other uses of this document are forbidden without written permission from the Arkansas Department of Education. All inquiries should be sent to Dr. Gayle Potter at the Arkansas Department of Education, 501-682-4558.

Arkansas Department of Education

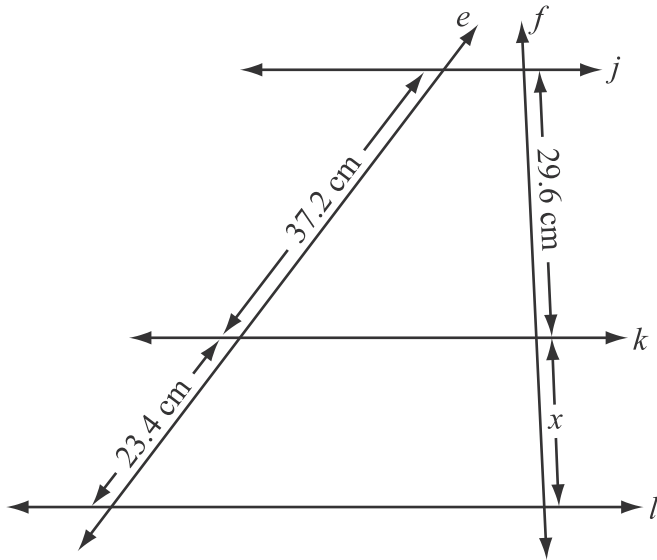
PART II Mid-Year End-of-Course Released Geometry Items

1. Based on the figure below, which relationship must be true?



- * A. $JK = LK$
- B. $JK > LK$
- C. $JK = 3(JL)$
- D. $JK + LK = 6(JL)$

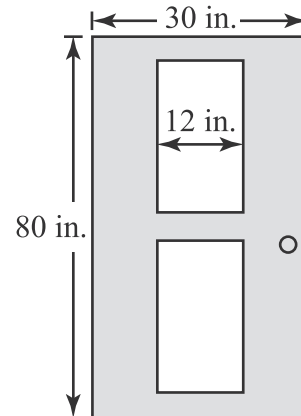
2. In the figure below, $j \parallel k \parallel l$.



What is the value of x ? Round your answer to the nearest tenth.

- A. 13.8 cm
- B. 15.8 cm
- * C. 18.6 cm
- D. 29.4 cm

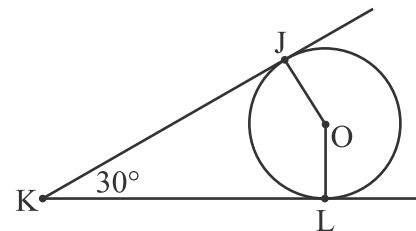
3. The two picture windows on the door below are geometrically similar in shape to the door.



If the door is 30 inches wide by 80 inches in height, and each window has a width of 12 inches, what is the height of each window?

- A. 4.5 inches
- * B. 32.0 inches
- C. 62.0 inches
- D. 64.0 inches

4. In the figure below, \overline{KJ} and \overline{KL} are tangent to circle O , and $m\angle JKL = 30^\circ$.

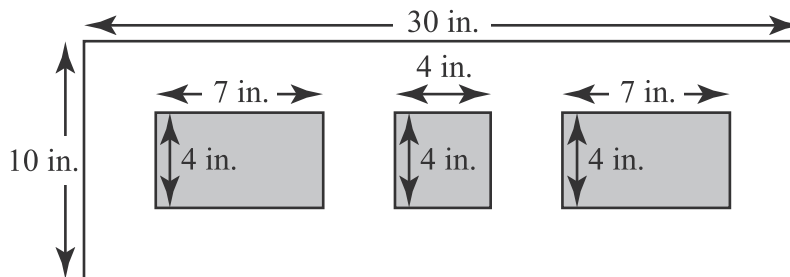


What is $m\angle JOL$?

- A. 50°
- B. 60°
- C. 120°
- * D. 150°

PART II Mid-Year End-of-Course Released Geometry Items

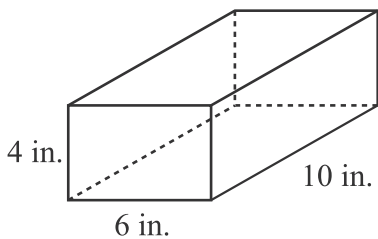
5. The figure below shows a game board.



A top is spun on the game board, and points are awarded based on where the top finally stops. The edges of the board are raised so that the top will stay on the game board. If the top is equally likely to stop anywhere on the board, what is the probability that it will stop in a shaded region?

- A. 14.67%
- B. 18.67%
- * C. 24.00%
- D. 29.33%

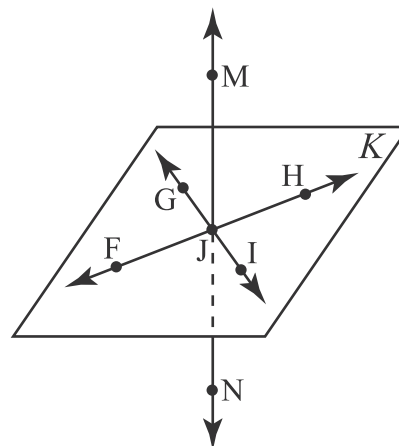
6. A box manufacturer sells a shoe box that is 6 inches by 4 inches by 10 inches, as shown below.



The box manufacturer is making a larger version of the box that will be 2 inches wider, 1 inch higher, and 2 inches longer than the one above. What is the ratio of the volume of the larger box to the volume of the original box?

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

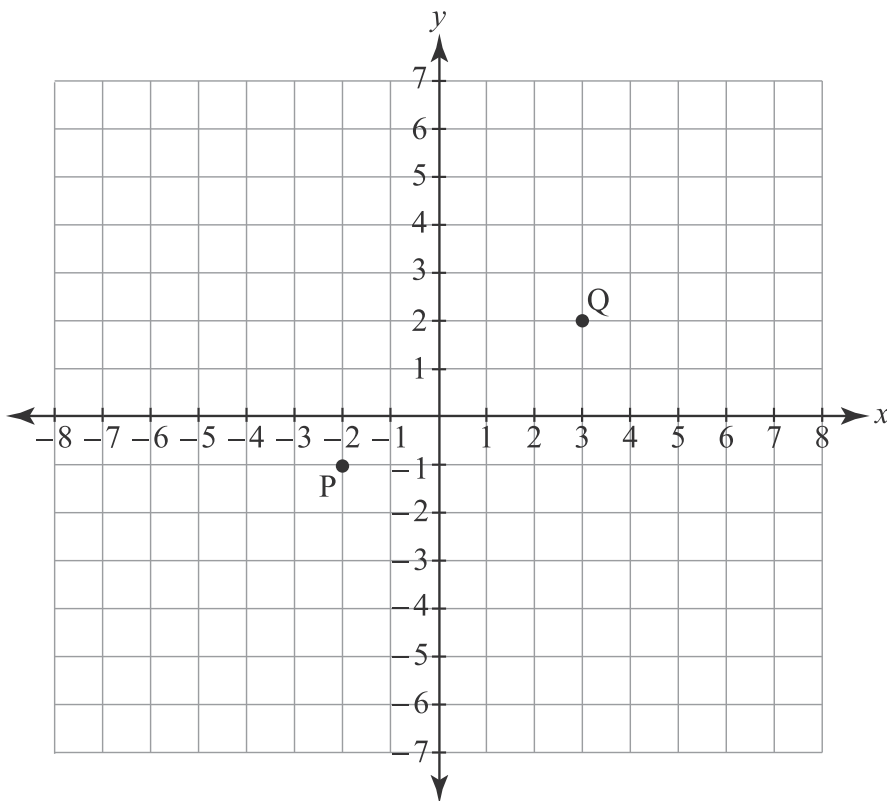
7. Which is the intersection of \overline{MN} and plane K ?



- * A. point J
- B. $\angle HJI$
- C. \overline{FH}
- D. \overline{GI}

PART II Mid-Year End-of-Course Released Geometry Items

8. Points P and Q are shown on the graph below.

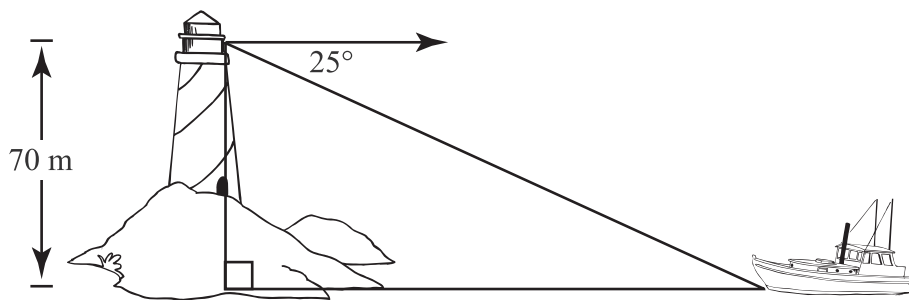


Point Q is the midpoint of \overline{PR} . What are the coordinates of point R?

- A. (0.5, 2.5)
 B. (2.5, 1.5)
 C. (6, 7)
 * D. (8, 5)
-
9. Sarah is watching a monitor that shows the locations of ships in the ocean. These locations are displayed on a coordinate grid. To avoid collisions, a safety zone with a radius of 4 units is kept around each ship. Sarah notices one ship at point $(-2, 3)$. Which equation represents the edge of the safety zone for this ship?
- A. $(x - 3)^2 + (y + 2)^2 = 16$
 B. $(x - 2)^2 + (y + 3)^2 = 16$
 * C. $(x + 2)^2 + (y - 3)^2 = 16$
 D. $(x + 3)^2 + (y - 2)^2 = 16$
10. Ray has four different pieces of wood measuring 1.0 foot, 1.5 feet, 2.0 feet, and 4.0 feet in length. He wants to use three of the pieces to make a triangular frame. Which length piece will Ray **not** be able to use in any combination with two of the other pieces to form a triangle?
- A. 1.0 foot
 B. 1.5 feet
 C. 2.0 feet
 * D. 4.0 feet

PART II Mid-Year End-of-Course Released Geometry Items

11. From the observation deck of a lighthouse 70 meters above sea level, the lighthouse keeper can see a fishing boat at a 25-degree angle of depression.

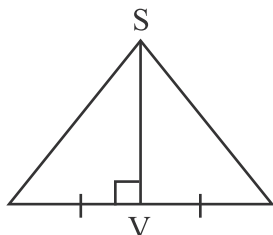


What is the horizontal distance, to the nearest meter, from the base of the lighthouse to the fishing boat?

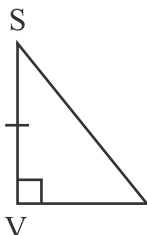
- A. 32 m
- B. 77 m
- * C. 150 m
- D. 165 m

12. In which figure is \overline{SV} a perpendicular bisector?

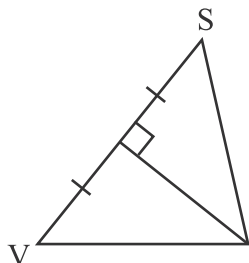
* A.



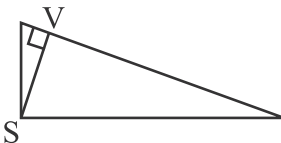
B.



C.



D.



PART II Mid-Year End-of-Course Released Geometry Items

13. Each figure shown below is made from equilateral triangles whose sides measure 1 cm.



Figure 1

Perimeter = 3 cm



Figure 2

Perimeter = 6 cm

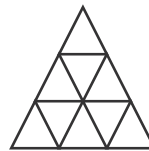


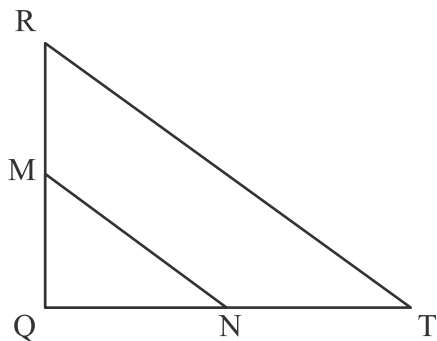
Figure 3

Perimeter = 9 cm

If the pattern continues, what will be the perimeter of Figure 6?

- A. 12 cm
- * B. 18 cm
- C. 21 cm
- D. 36 cm

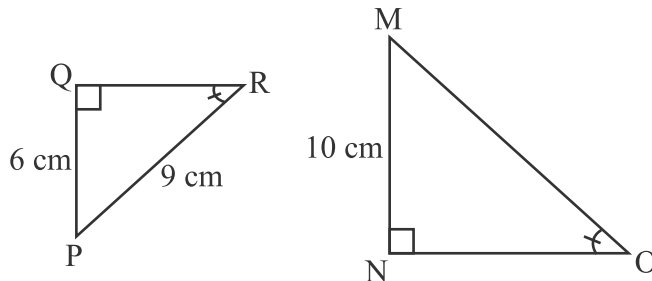
14. Points M and N are the midpoints of two sides of $\triangle QRT$.



Which statement **cannot** be proven?

- * A. $\overline{QR} \perp \overline{QT}$
- B. $QN = NT$
- C. $QR = 2QM$
- D. $\angle MNQ \cong \angle RTQ$

15. In the figure below, $\triangle PQR \sim \triangle MNO$, $QP = 6$ cm, $PR = 9$ cm, and $MN = 10$ cm.

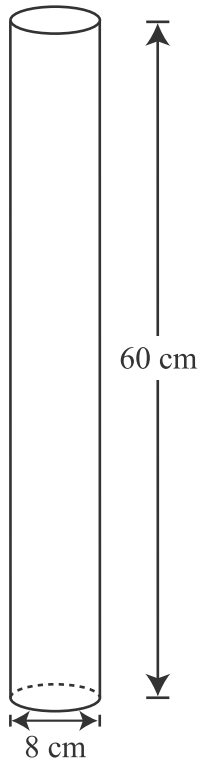


What is the measure of \overline{MO} , to the nearest tenth of a centimeter?

- A. 5.4 cm
- B. 6.7 cm
- C. 10.1 cm
- * D. 15.0 cm

PART II Mid-Year End-of-Course Released Geometry Items

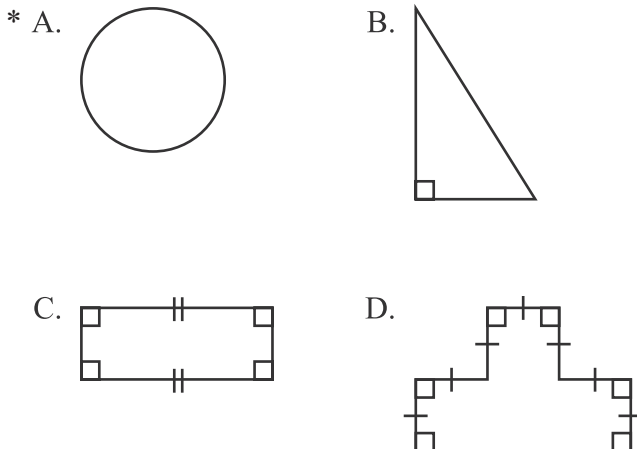
16. A cardboard tube is shown below.



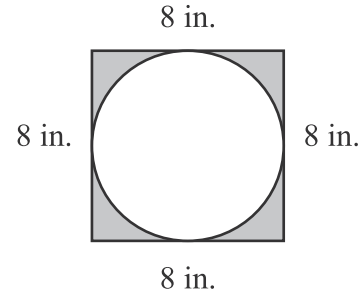
What is the **approximate** volume of the tube?

- A. 754 cubic centimeters
- B. 1508 cubic centimeters
- * C. 3016 cubic centimeters
- D. 12064 cubic centimeters

17. Which figure will **not** tessellate?

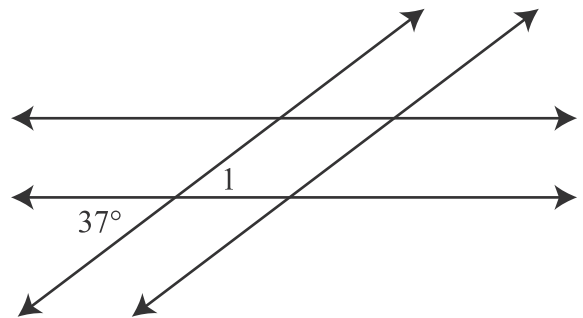


18. A book illustrator is creating a bookcover. The book will be square, and the design will have a circle that touches each of the four sides. The book will be 8 inches long on each side, as shown below.



If the illustrator colors the area outside the circle with blue ink, what area of the cover will be colored blue? Round your answer to the nearest square inch.

- * A. 14 in.²
 - B. 18 in.²
 - C. 39 in.²
 - D. 50 in.²
19. The figure below shows the intersection of two sets of railroad tracks.

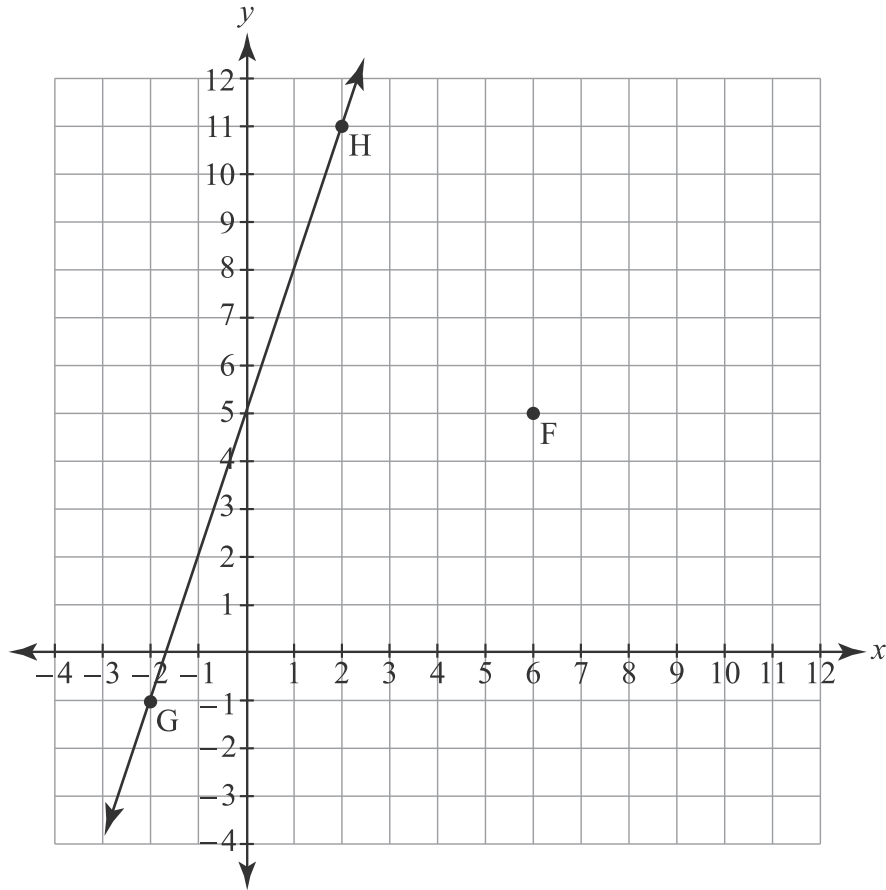


What is $m\angle 1$?

- * A. 37°
- B. 53°
- C. 127°
- D. 143°

PART II Mid-Year End-of-Course Released Geometry Items

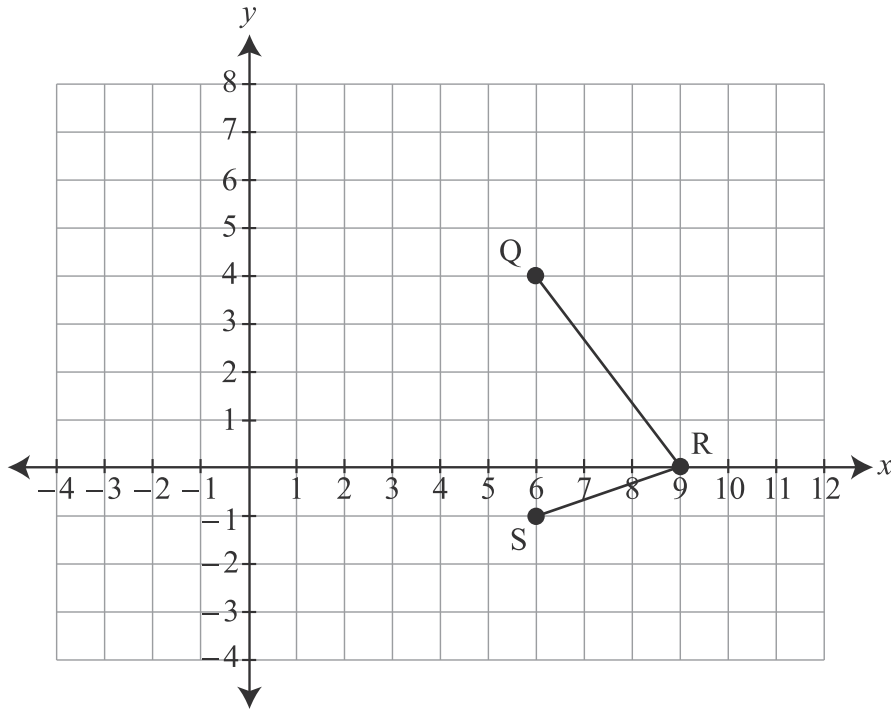
20. What is the equation of the line that goes through point F and is parallel to \overline{GH} below?



- A. $y = -\frac{1}{3}x + 7$
- B. $y = \frac{1}{2}x + 2$
- * C. $y = 3x - 13$
- D. $y = 2x - 7$

PART II Mid-Year End-of-Course Released Geometry Items

21. George is constructing parallelogram QRST on a coordinate plane. He has drawn the two segments, \overline{QR} and \overline{RS} , shown on the graph below.

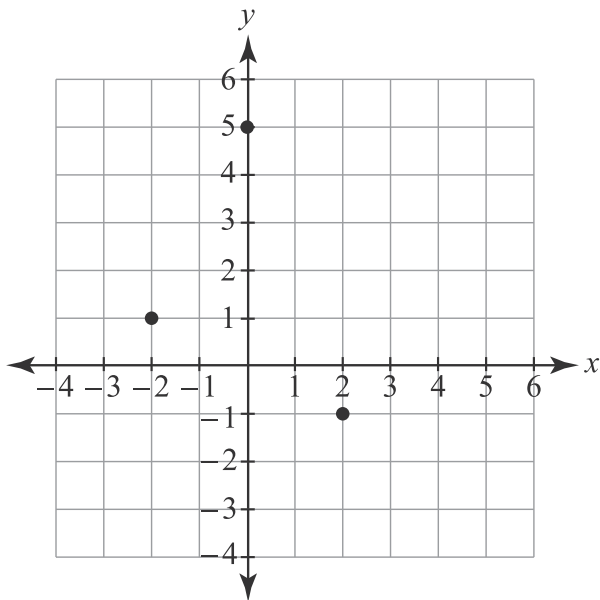


Next, he wants to draw the side parallel to \overline{QR} . What is the slope-intercept equation of the line passing through point S that is parallel to \overline{QR} ?

- A. $y = -3x + 17$
- * B. $y = -\frac{4}{3}x + 7$
- C. $y = \frac{3}{4}x + \frac{11}{2}$
- D. $y = \frac{1}{3}x - 3$

PART II Mid-Year End-of-Course Released Geometry Items

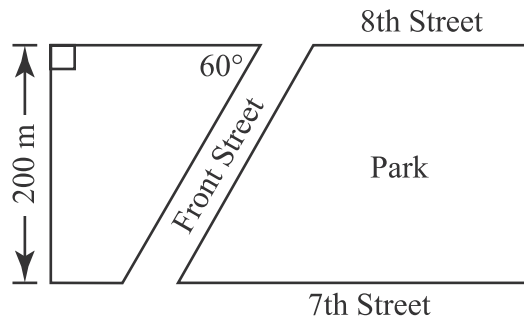
22. The three points shown below, $(-2, 1)$, $(0, 5)$, and $(2, -1)$, are vertices of a square.



What are the coordinates of the fourth vertex?

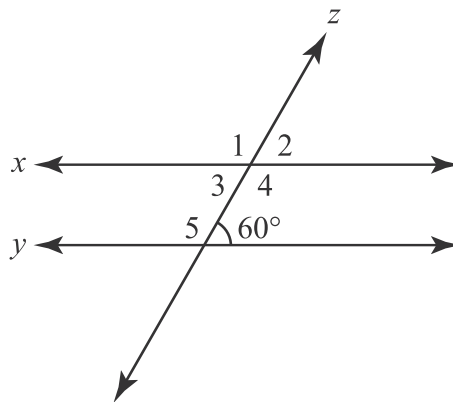
- A. $(3, 3)$
 - B. $(3, 4)$
 - * C. $(4, 3)$
 - D. $(5, 0)$
23. Mr. Brown's art project for his seniors was to design plans for their dream house. He instructed all of the students to use the scale of $\frac{1}{4}$ inch = 1 foot for the dimensions. Devin wants the bedroom in his dream house to be 12.5 feet by 18 feet. What should be the dimensions on the scale drawing of his bedroom? Round your answer to the nearest hundredth of an inch.
- * A. 3.13 inches by 4.50 inches
 - B. 5.00 inches by 7.20 inches
 - C. 12.25 inches by 17.75 inches
 - D. 50.00 inches by 72.00 inches

24. The figure below shows part of a map.



How long is the block of Front Street from 7th Street to 8th Street? Round your answer to the nearest meter.

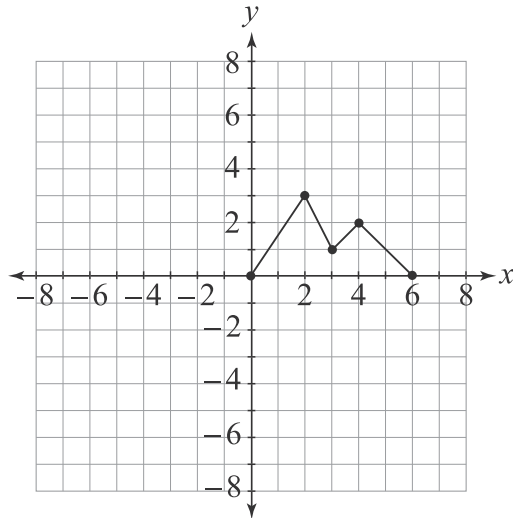
- A. 173 m
 - * B. 231 m
 - C. 346 m
 - D. 400 m
25. In the figure below, which would prove $x \parallel y$?



- A. $m\angle 1 = 60^\circ$
- * B. $m\angle 2 = 60^\circ$
- C. $m\angle 3 = 120^\circ$
- D. $m\angle 5 = 120^\circ$

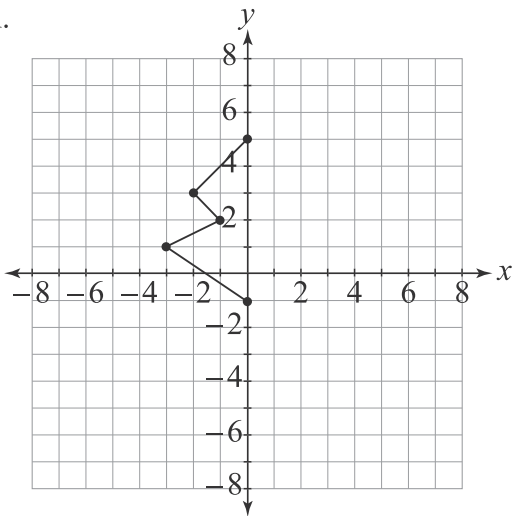
PART II Mid-Year End-of-Course Released Geometry Items

26. The figure graphed below is rotated 90° clockwise about the origin and translated up 1 unit.

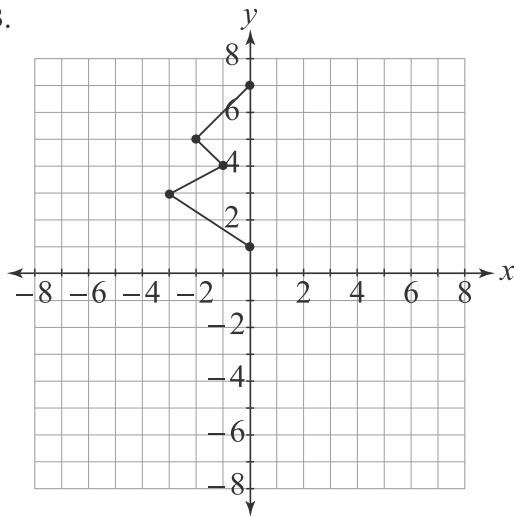


Which is the resulting image?

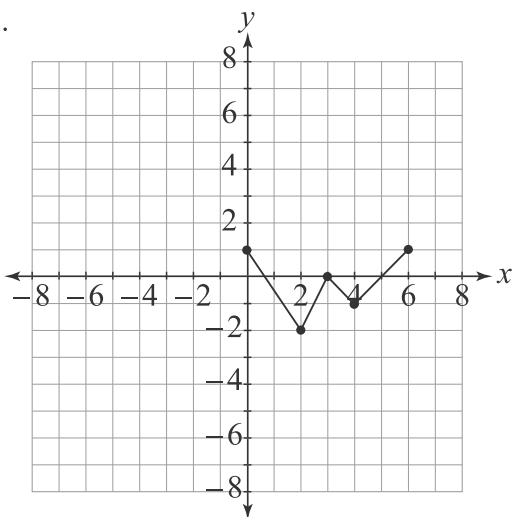
A.



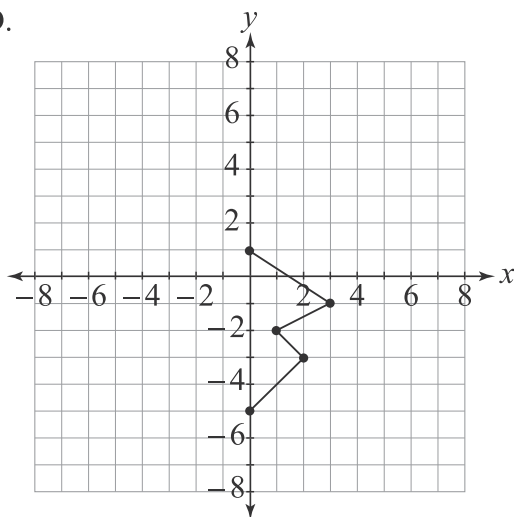
B.



C.

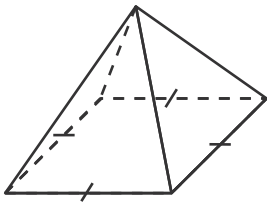


* D.



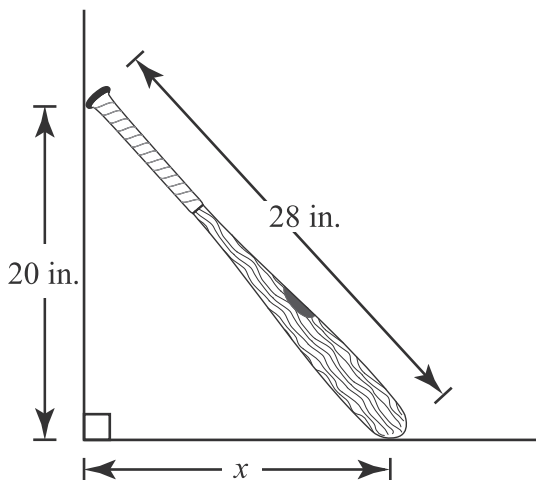
PART II Mid-Year End-of-Course Released Geometry Items

27. The figure below is intersected by a plane parallel to its base.



What shape is the cross section?

- A. pentagon
 - B. hexagon
 - C. triangle
 - * D. square
28. Greg leaned his baseball bat against a wall after his game. The bat is 28 inches long and touches the wall 20 inches above the ground, as shown in the figure below.



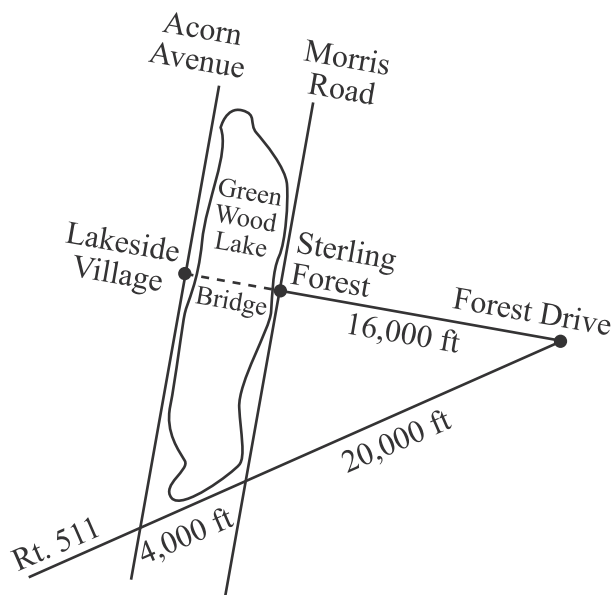
What is the distance, x , from the bottom of the wall to the point where Greg's baseball bat touches the ground? Round your answer to the nearest tenth of an inch.

- A. 6.9 inches
- * B. 19.6 inches
- C. 27.6 inches
- D. 34.4 inches

29. A dodecahedron is a Platonic solid made of 12 pentagons. How many pentagons meet at each vertex?

- * A. 3
- B. 5
- C. 10
- D. 12

30. The map below shows the area surrounding Green Wood Lake. Morris Road and Acorn Avenue run parallel to one another and are separated by Green Wood Lake.



Sterling Forest and Lakeside Village plan to build a bridge over the lake to connect their towns. What is the length of the bridge? Round your answer to the nearest hundred feet.

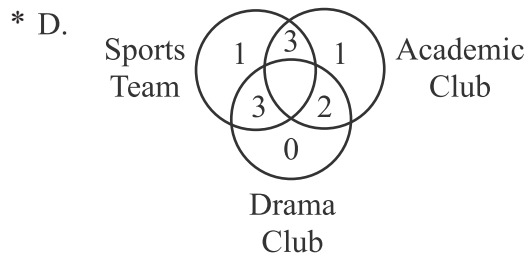
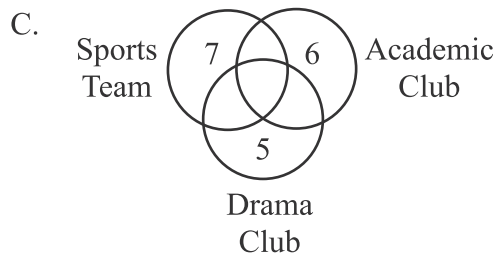
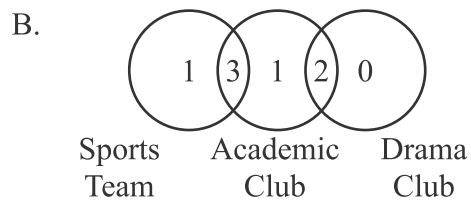
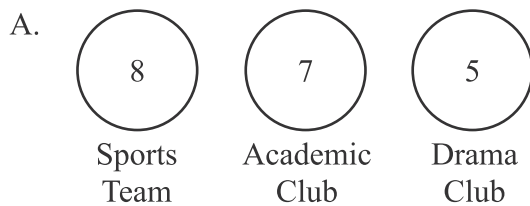
- A. 2,700 feet
- * B. 3,200 feet
- C. 5,000 feet
- D. 80,000 feet

PART II Mid-Year End-of-Course Released Geometry Items

31. Ten students have each joined two activities, as shown in the table below.

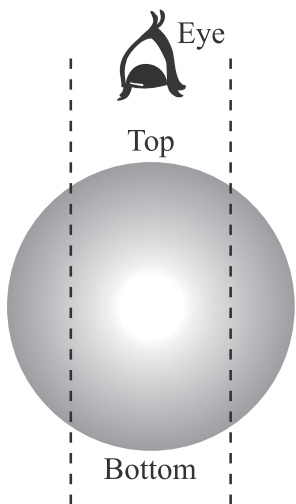
Student	Activity 1	Activity 2
Will	Sports Team	Sports Team
Lin	Sports Team	Drama Club
Emma	Sports Team	Academic Club
Jake	Academic Club	Academic Club
Hannah	Drama Club	Academic Club
Arial	Sports Team	Academic Club
Cherie	Drama Club	Sports Team
Josh	Sports Team	Academic Club
Alexis	Drama Club	Academic Club
Matt	Drama Club	Sports Team

Which Venn diagram shows the distribution of students in the activities?

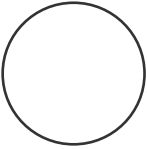
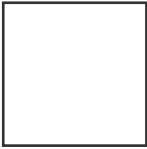
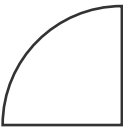



PART II Mid-Year End-of-Course Released Geometry Items

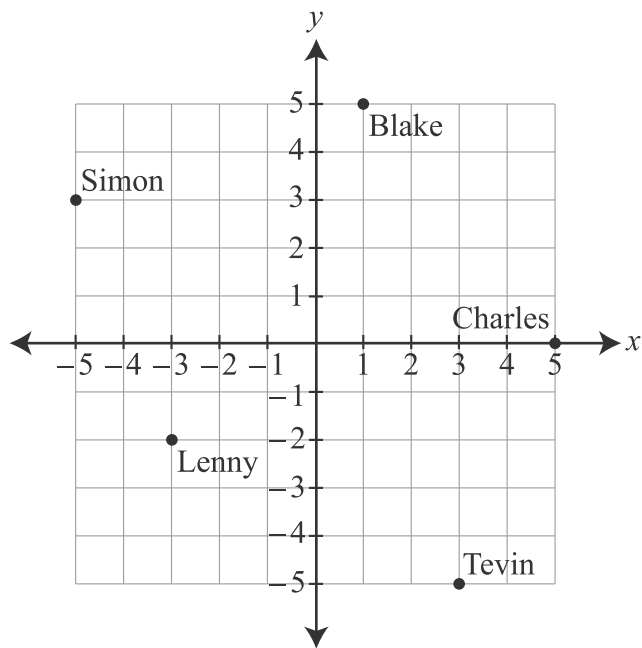
32. Michelle has a foam sphere with a radius of six inches. She slices the sphere with two vertical cuts parallel to each other as shown below.



The cut left and right sides of the sphere are disposed. Which is the orthographic view from the top of the remaining portion of the sphere?

- A.  B. 
- C.  * D. 

33. Blake used a coordinate grid to show the locations of his house and his four friends' houses, as shown below.

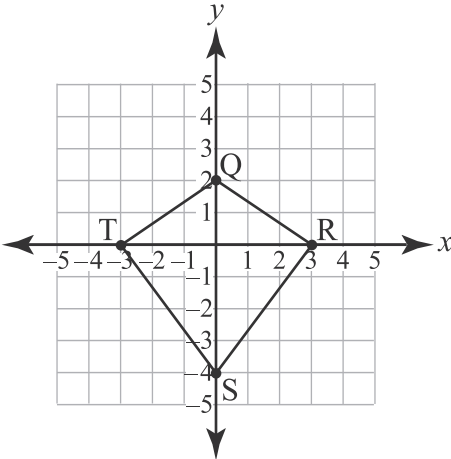


How far away on the coordinate grid is Blake's house from Lenny's house? Round your answer to the nearest tenth.

- A. 2.2 units
 B. 3.6 units
 * C. 8.1 units
 D. 8.5 units

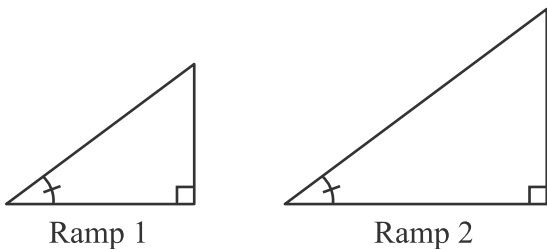
PART III End-of-Course Released Geometry Items

1. Quadrilateral QRST is shown below.



What type of quadrilateral is QRST?

- * A. kite
 - B. rhombus
 - C. rectangle
 - D. trapezoid
2. Jamal wants to build two ramps to use as bike jumps. The side views of the ramps are shown below.



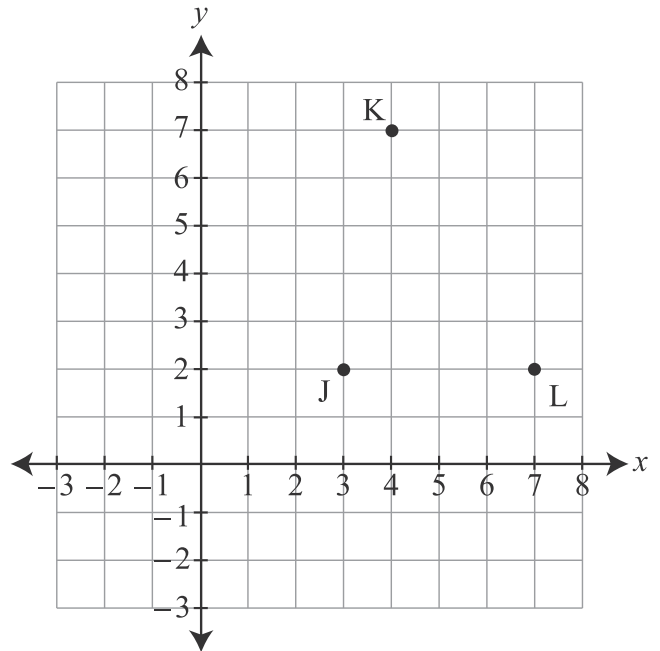
Both ramps will have the same launch angle. What can be said about the side views of the two ramps?

- * A. They are similar triangles.
- B. They are isosceles triangles.
- C. They are congruent triangles.
- D. They are equilateral triangles.

3. Chloe is using different colored tiles to decorate a wall. In her pattern, the blue tile is next to the green tile, the yellow tile is between the blue tile and the red tile, and the white tile is next to and on the left of the green tile. What is the order of the tiles, from left to right?

- A. blue, green, yellow, red, white
- B. red, yellow, blue, green, white
- C. red, yellow, blue, white, green
- * D. white, green, blue, yellow, red

4. Points J, K, and L, shown below, are the vertices of a triangle.

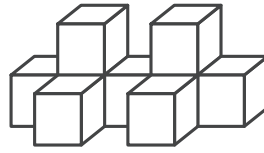


Which is the description of the triangle?

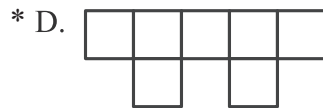
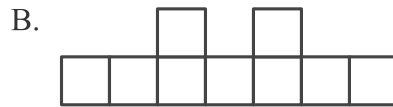
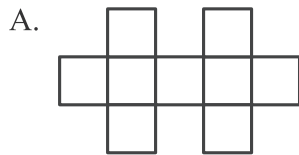
- A. a right triangle
- * B. a scalene triangle
- C. an isosceles triangle
- D. an equilateral triangle

PART III End-of-Course Released Geometry Items

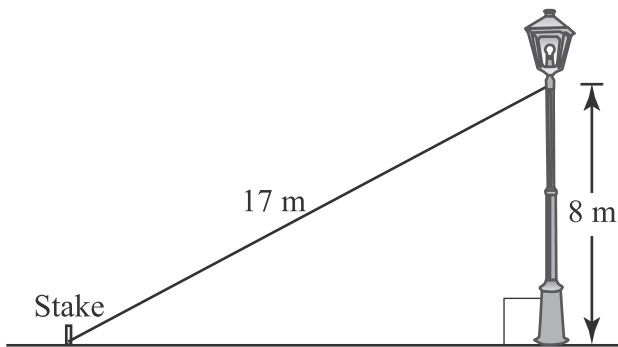
5. Keith built the figure shown below using nine cubes.



Which of the following would be the top view?



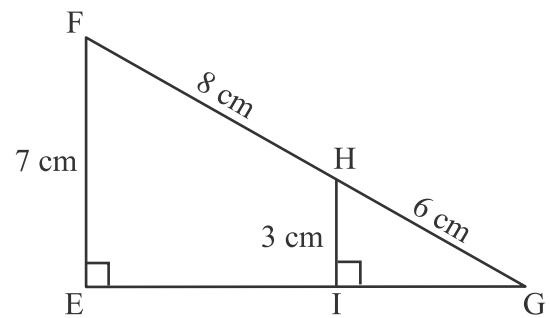
6. Dave has 17 meters of wire that he attaches to a lamppost 8 meters above its base, as shown below. The other end of the wire will attach to a stake in the ground.



If Dave fully extends the wire from the lamppost to the stake, how far from the base of the lamppost will the stake be? Round your answer to the nearest whole number.

- A. 8 meters
 B. 9 meters
 * C. 15 meters
 D. 19 meters

7. In the figure below, $FH = 8$ cm, $HG = 6$ cm, $EF = 7$ cm, and $IH = 3$ cm.

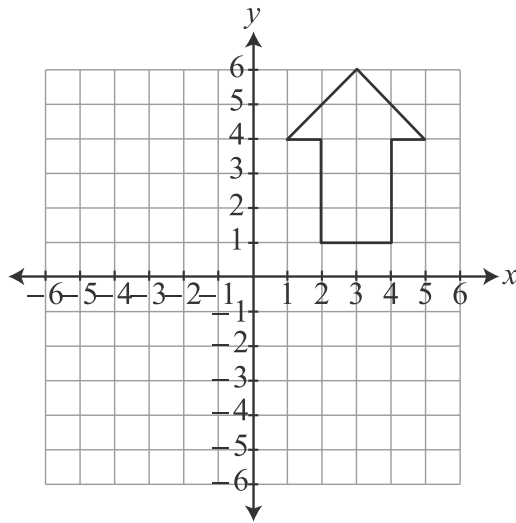


What is $\sin(G)$?

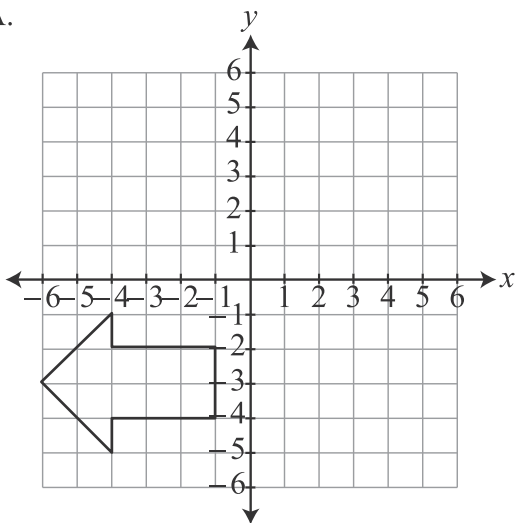
- A. $\frac{1}{5}$
 * B. $\frac{1}{2}$
 C. $\frac{3}{4}$
 D. $\frac{7}{8}$

PART III End-of-Course Released Geometry Items

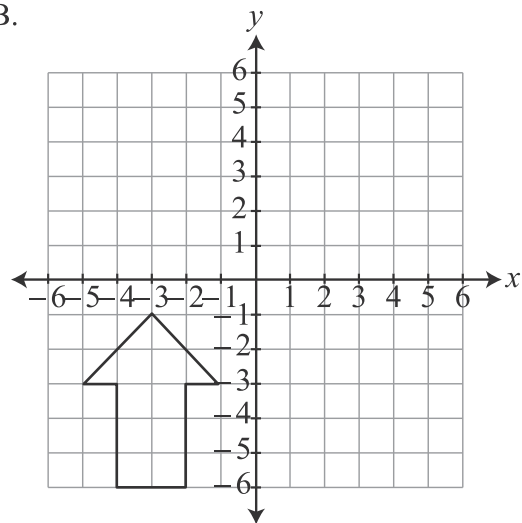
8. Which image will result from the figure below being rotated 90° clockwise about the origin and then reflected across the y -axis?



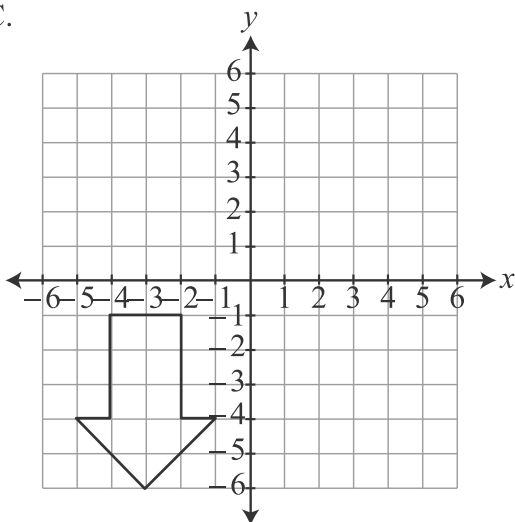
* A.



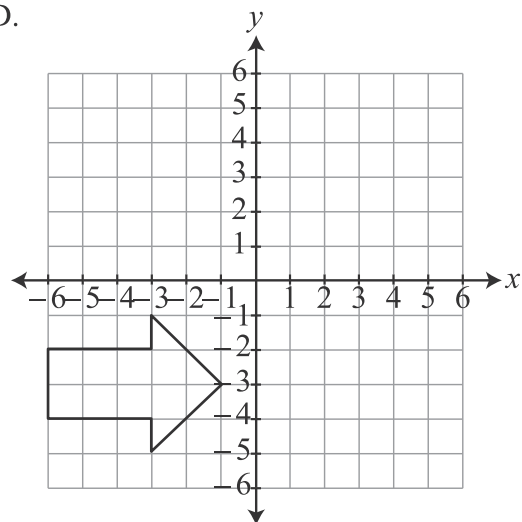
B.



C.



D.



PART III End-of-Course Released Geometry Items

9. If the pattern below continues, how many small squares will be in Figure 8?

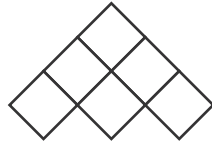
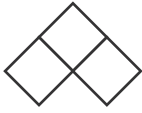


Figure 1

Figure 2

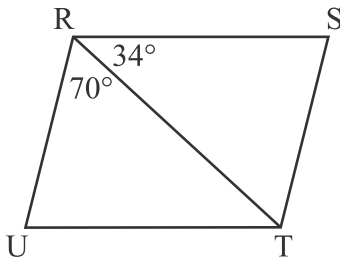
Figure 3

- * A. 36
- B. 33
- C. 27
- D. 22

10. Which of the following is an example of a Platonic solid?

- A. cone
- * B. cube
- C. square pyramid
- D. triangular prism

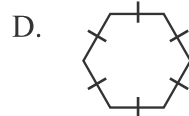
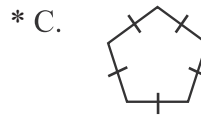
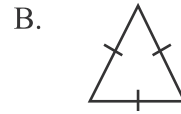
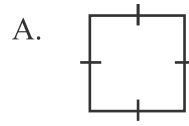
11. In the figure below, RSTU is a parallelogram.



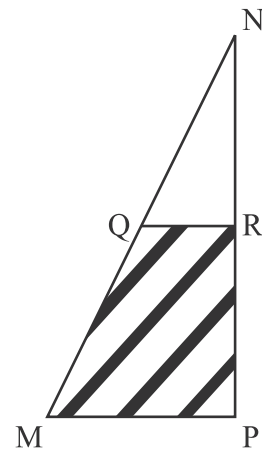
What is $m\angle S$?

- A. 34°
- B. 70°
- * C. 76°
- D. 104°

12. Which figure does **not** tessellate on a plane?



13. Tyler's sailboat has a triangular sail, as shown below.

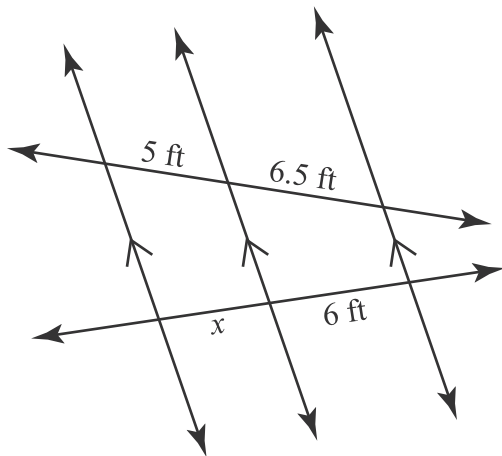


Point Q is the midpoint of \overline{MN} , and point R is the midpoint of \overline{NP} . What does \overline{QR} represent in $\triangle MNP$?

- A. the altitude
- B. the median
- C. the midpoint
- * D. the midsegment

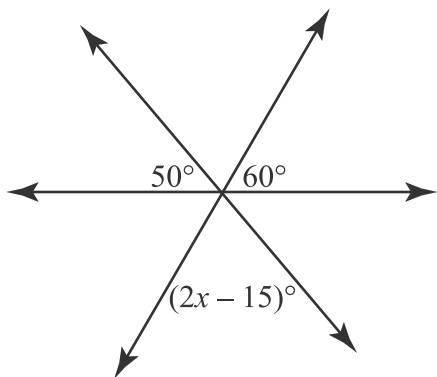
PART III End-of-Course Released Geometry Items

14. The figure below shows the pathways between booths in a section of the school fair. The distances between select pathways are shown.



Rounded to the nearest tenth of a foot, what is the value of x ?

- * A. 4.6 feet
 - B. 5.4 feet
 - C. 5.5 feet
 - D. 7.8 feet
15. What is the value of x in the figure below?



- A. 37.5
- * B. 42.5
- C. 47.5
- D. 62.5

16. Nira is creating a game board with a coordinate grid. She has drawn a road whose endpoints are at $(21, 15)$ and $(53, 39)$. Nira wants to place a game piece so that it is at the midpoint of the road. What are the coordinates of the midpoint?

- A. $(16, 12)$
- B. $(18, 46)$
- C. $(27, 37)$
- * D. $(37, 27)$

17. A forest fire is estimated to have started at point S, located at $(7, 5)$ on a map of the forest. The burned area has a radius of approximately 13 miles. What is the equation of the circle representing the area burned by the fire?

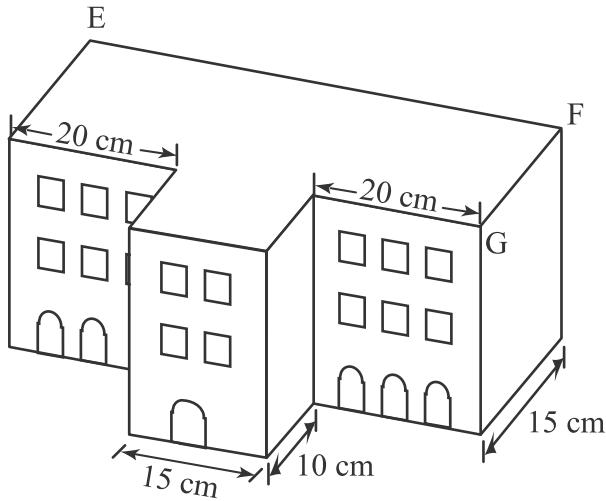
- A. $(x - 5)^2 + (y - 7)^2 = 13$
- B. $(x + 5)^2 + (y + 7)^2 = 13$
- * C. $(x - 7)^2 + (y - 5)^2 = 169$
- D. $(x + 7)^2 + (y + 5)^2 = 169$

18. Which of the following must be true using deductive reasoning?

- A. Dogs have four legs. Pierre has four legs. Pierre is a dog.
- B. People have two legs. Jaquine has two legs. Jaquine is a person.
- C. A chef cooks food. Alfred cooks food. Alfred is a chef.
- * D. A polygon with three sides is a triangle. Polygon E has three sides. Polygon E is a triangle.

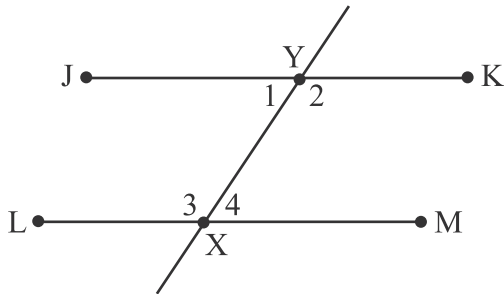
PART III End-of-Course Released Geometry Items

19. The figure below is a scale model of a proposed school building.



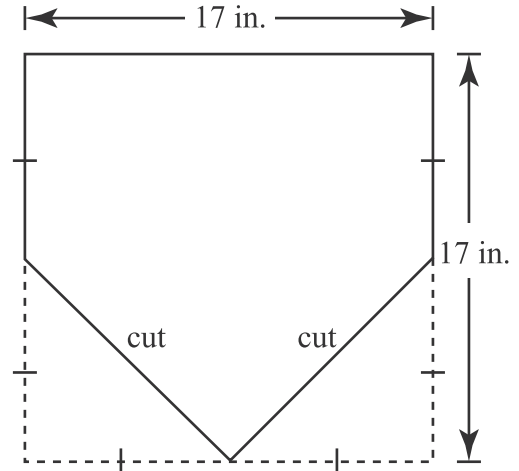
If edge \overline{FG} on the actual building will have a length of 30 meters, how long will edge \overline{EF} measure on the actual building?

- A. 40 m
 - B. 80 m
 - C. 100 m
 - * D. 110 m
20. Which would be sufficient to prove $\overline{JK} \parallel \overline{LM}$?



- * A. $m\angle 2 = m\angle 3$
- B. $m\angle 2 = m\angle 4$
- C. $m\angle 1 + m\angle 3 = 90^\circ$
- D. $m\angle 2 + m\angle 3 = 180^\circ$

21. Diane constructed a wooden home plate for her softball team. She started with a square with sides measuring 17 inches, found the midpoints of three sides, and cut off two corners, as shown below.



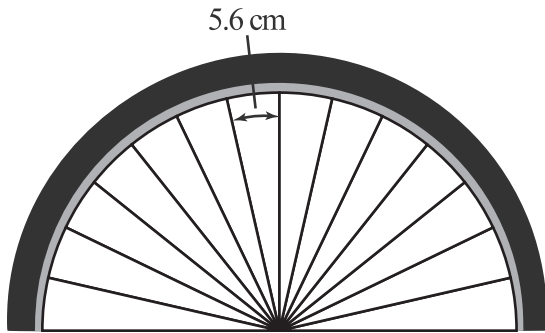
What portion of her original square was **not** used?

- A. $\frac{1}{8}$
 - * B. $\frac{1}{4}$
 - C. $\frac{1}{2}$
 - D. $\frac{3}{4}$
22. Kristen is designing a triangular ramp so she can practice jumps with her bike. She has three pieces of wood. Which could be the possible measurements of these three pieces?

- A. 2 feet, 5 feet, 9 feet
- B. 3 feet, 4 feet, 8 feet
- * C. 3 feet, 6 feet, 8 feet
- D. 4 feet, 5 feet, 9 feet

PART III End-of-Course Released Geometry Items

23. A wheel is being made with spokes that are 25 cm long, as shown in the figure below. The spokes meet at the center of the wheel and will be separated so that there is 5.6 cm along the curved part of the wheel between any two ends of a spoke.



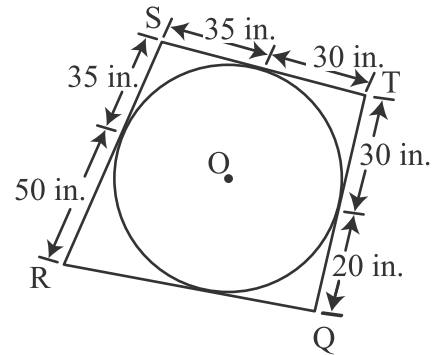
What is the central angle between any two consecutive spokes? Round your answer to the nearest degree.

- * A. 13°
- B. 14°
- C. 26°
- D. 28°

24. The slope-intercept form of a line is $y = \frac{2}{3}x + 2$. Which line is parallel to the given line?

- A. $y = \frac{1}{3}x + 2$
- * B. $y = \frac{2}{3}x - 3$
- C. $y = \frac{3}{2}x - \frac{2}{3}$
- D. $y = -\frac{3}{2}x - 6$

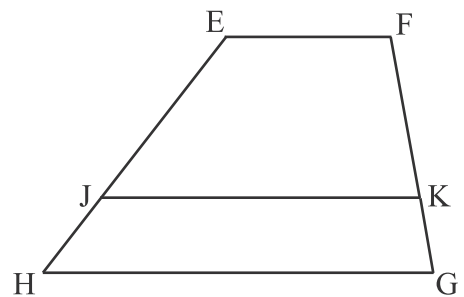
25. Circle O is inscribed in quadrilateral QRST, as shown below.



What is RQ?

- A. 50 in.
- B. 65 in.
- * C. 70 in.
- D. 85 in.

26. In trapezoid EFGH below, $\overline{EF} \parallel \overline{JK} \parallel \overline{HG}$, $JE = 15$ cm, $FK = 12$ cm, and $HJ = 5.5$ cm.

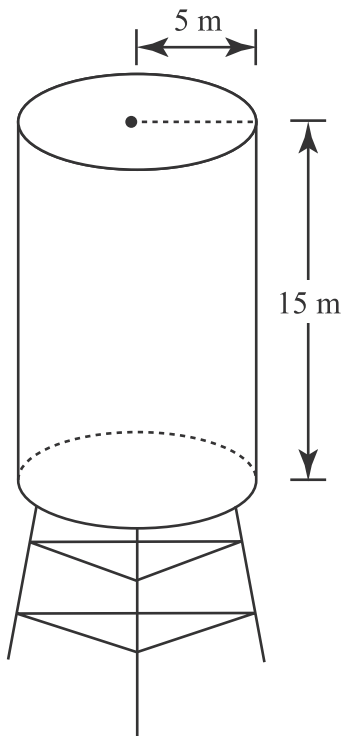


What is GK?

- A. 2.5 cm
- * B. 4.4 cm
- C. 6.9 cm
- D. 8.5 cm

PART III End-of-Course Released Geometry Items

27. A cylindrical water tower with a height of 15 m and a radius of 5 m is shown in the figure below.



What is the largest volume of water that the tower can hold? Round your answer to the nearest cubic meter.

- A. 236 m^3
- B. 375 m^3
- * C. 1178 m^3
- D. 3533 m^3

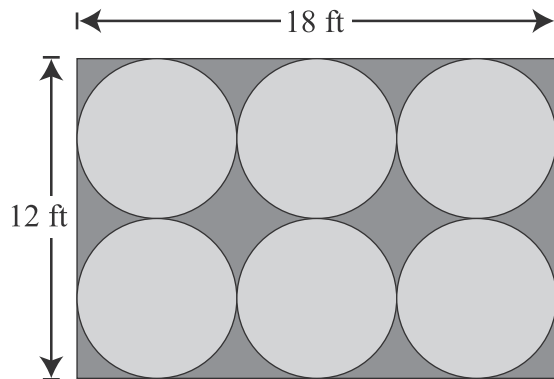
28. The equation of a circle is:

$$(x - 1)^2 + (y + 3)^2 = 25$$

Which point is the center of the circle?

- A. $(-3, 1)$
- B. $(-1, 3)$
- * C. $(1, -3)$
- D. $(3, -1)$

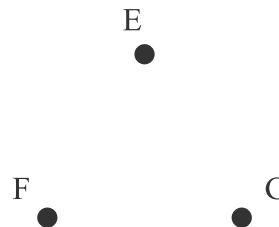
29. The outdoor garden of the Municipal Building has six circular grass areas, as shown below.



A ball is dropped from a hot air balloon and lands somewhere in the rectangular garden. If the ball is equally likely to land anywhere in the garden, what is the probability that it lands on any of the circular grass areas? Express your answer as a decimal rounded to the nearest hundredth.

- A. 0.13
- B. 0.21
- C. 0.52
- * D. 0.79

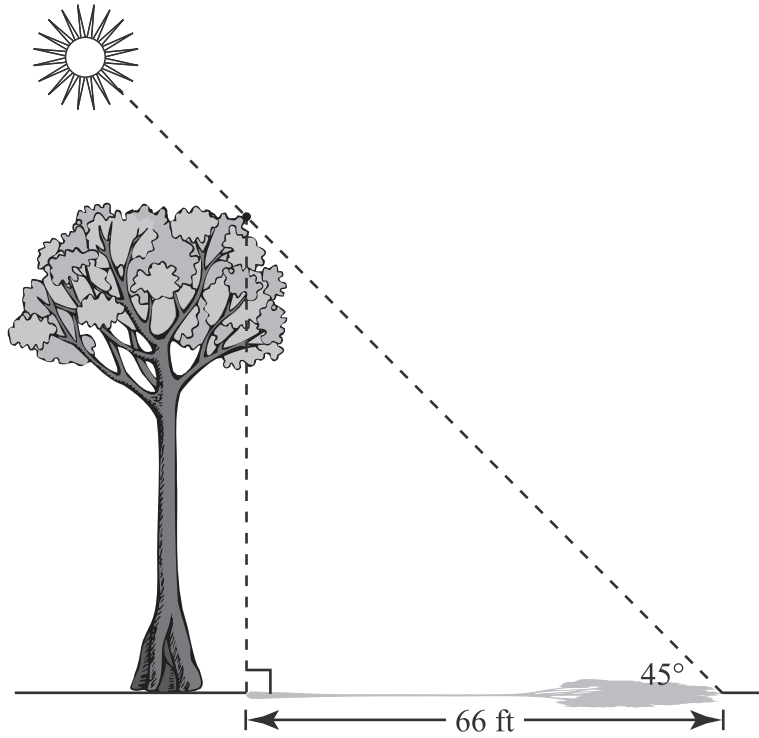
30. Which can be identified using all three points E, F, and G?



- A. a ray
- * B. a plane
- C. a chord
- D. a line segment

PART III End-of-Course Released Geometry Items

31. When the Sun is at an elevation of 45° , a tree casts a shadow 66 feet in length, as shown in the figure below.

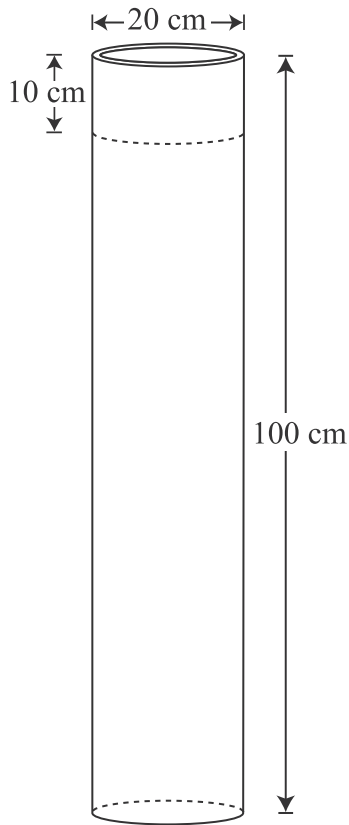


How tall is the tree?

- * A. 66 feet
- B. $44\sqrt{3}$ feet
- C. $66\sqrt{2}$ feet
- D. $66\sqrt{3}$ feet

PART III End-of-Course Released Geometry Items

32. Concrete columns are made by pouring the wet mixture into waxed cardboard tubes. These tubes are sold with neither a top nor a bottom circular face.



A construction worker saws 10 centimeters off of a column-casting tube. By how much has she decreased the tube's surface area? Round your answer to the nearest square centimeter.

- * A. 628 square centimeters
- B. 1246 square centimeters
- C. 3142 square centimeters
- D. 5655 square centimeters

33. Which figure does **not** have triangular cross sections?

