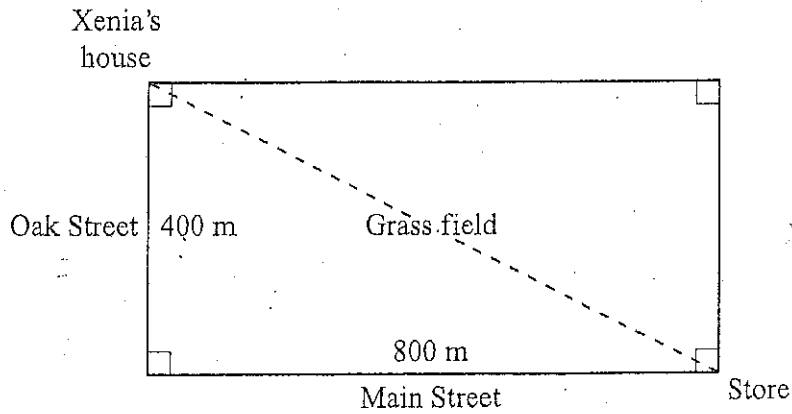


10th Grade Snow Day #1

1. Xenia needs to get from her house to the store. Since she is in a hurry, she wants to cut diagonally across the grass field.



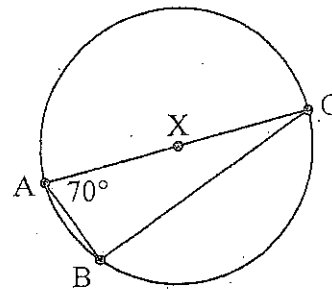
Approximately how many meters will Xenia walk if she goes this way?

- A. 35 m
 - B. 894 m
 - C. 1,200 m
 - D. 400,000 m
2. Peter is enlarging a photo that is 9 inches long and 6 inches wide to poster size. He enlarges the photo so that the sides are proportional.

If the width of the poster is 36 inches, what is the length of the poster?

- A. 24 inches
- B. 36 inches
- C. 45 inches
- D. 54 inches

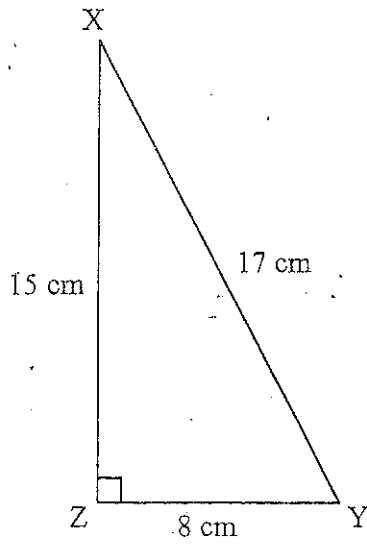
3. $\triangle ABC$ is inscribed in circle X and $m\angle BAC = 70^\circ$.



What is $m\angle ACB$?

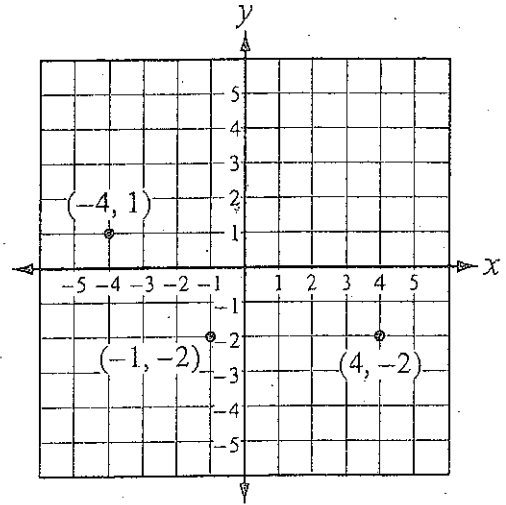
- A. 20°
- B. 90°
- C. 110°
- D. 180°

4. In $\triangle XYZ$, which has the value $\frac{15}{17}$?



- A. $\sin X$
- B. $\sin Y$
- C. $\tan X$
- D. $\tan Y$

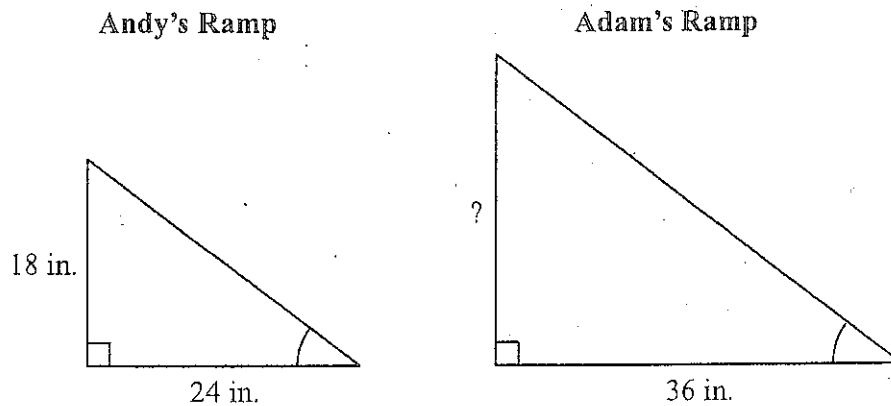
5. The graph below shows three vertices of a quadrilateral at the points $(-4, 1)$, $(4, -2)$, and $(-1, -2)$.



If the fourth vertex is at $(1, 1)$, what is the most precise name for the quadrilateral?

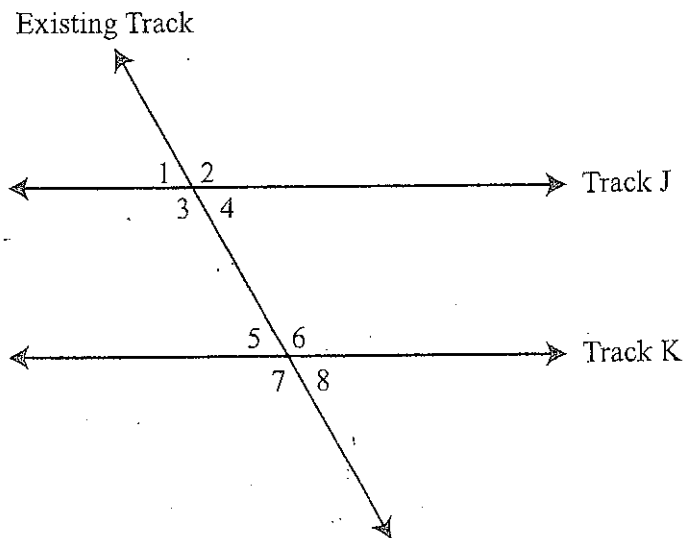
- A. square
- B. rectangle
- C. trapezoid
- D. parallelogram

6. Over the weekend, Andy built a skateboard ramp that has a length of 24 inches and a height of 18 inches. Adam wants to build a geometrically similar ramp for his skateboard. Adam's ramp will have a length of 36 inches. What will be the height of Adam's ramp?



- A. 27 inches
B. 37 inches
C. 48 inches
D. 53 inches
-
7. Jana wants to build a pyramid by stacking cups upside down on each other. If the top of the pyramid has 1 cup and the bottom of the pyramid has 6 cups, how many rows of cups are in Jana's pyramid?
- A. 3
B. 5
C. 6
D. 7
8. Which best describes a polygon that tessellates?
- A. When it covers an area, it leaves gaps and has overlaps.
B. When it covers an area, it leaves gaps but has no overlaps.
C. When it covers an area, it does not leave gaps but has overlaps.
D. When it covers an area, it does not leave gaps and has no overlaps.

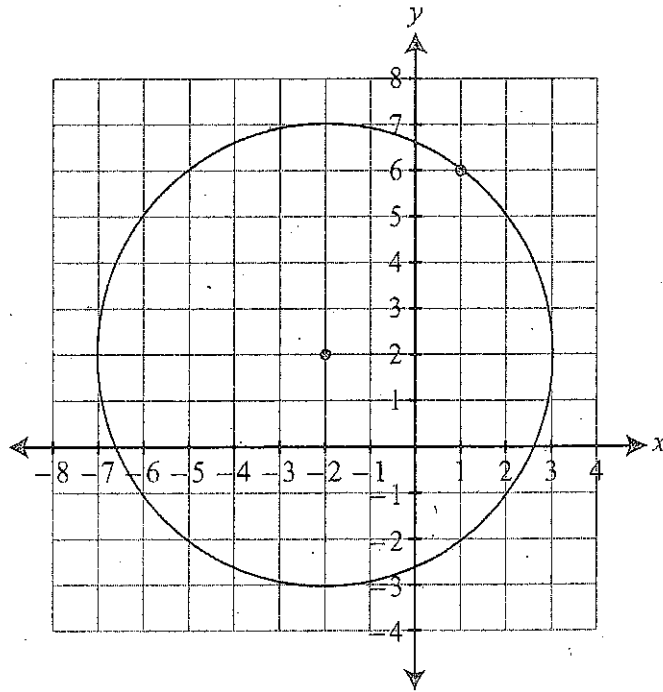
9. Construction workers are laying new railroad tracks. They must lay parallel tracks for trains coming into town and trains going out. Both of the new railroad tracks will cross an existing track that runs through the town, as shown below.



Which of the following pairs of angles must be equal so that Track J \parallel Track K?

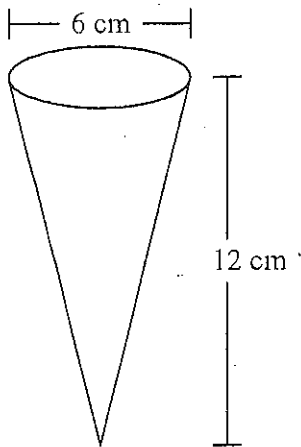
- A. $\angle 1$ and $\angle 6$
 - B. $\angle 2$ and $\angle 8$
 - C. $\angle 3$ and $\angle 6$
 - D. $\angle 5$ and $\angle 7$
-
10. What are the center and radius of a circle having the equation $(x - 3)^2 + (y + 1)^2 = 16$?
- A. center at $(-3, 1)$, radius = 4 units
 - B. center at $(3, -1)$, radius = 4 units
 - C. center at $(-3, 1)$, radius = 16 units
 - D. center at $(3, -1)$, radius = 16 units

11. What is the radius of the circle shown below?



- A. $\sqrt{15}$
- B. $\sqrt{17}$
- C. 5
- D. 7

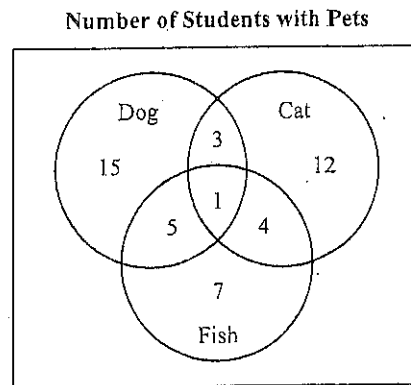
12. The drain shown below has a diameter of 6 cm and a height of 12 cm.



If the diameter of the drain is shortened to 4 cm but the volume does not change, what must the height of the drain become?

- A. 14 cm
B. 16 cm
C. 18 cm
D. 27 cm
13. What is the equation of the line through (8, 1) that is parallel to $y = -2x + 5$?
- A. $y = -2x + 17$
B. $y = \frac{1}{2}x - 3$
C. $y = 2x - 15$
D. $y = 8x + 1$

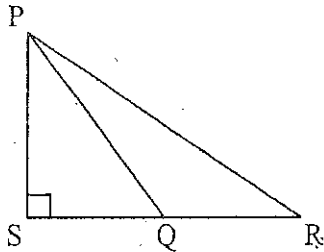
14. Kevin took a survey of students at lunch to determine the kinds of pets that they owned. The information that he collected is shown in the Venn diagram below.



How many students in the survey owned a cat, a dog, or both, but no fish?

- A. 27
B. 30
C. 33
D. 40

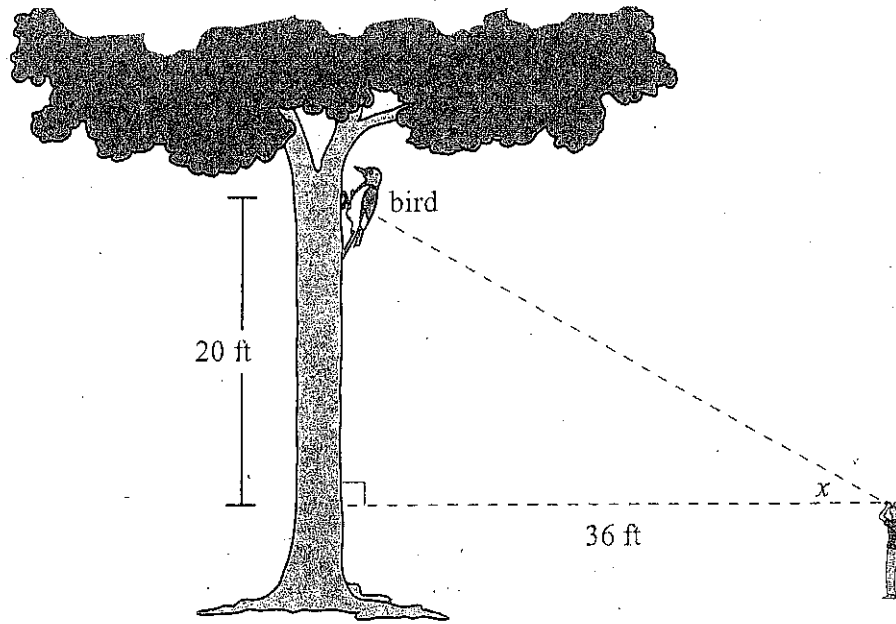
15. In the figure shown below, \overline{PQ} is a median of $\triangle PRS$, $PS = 4$ cm, and $SQ = 3$ cm.



What is PR ? Round your answer to the nearest tenth.

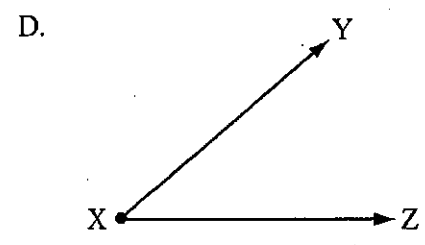
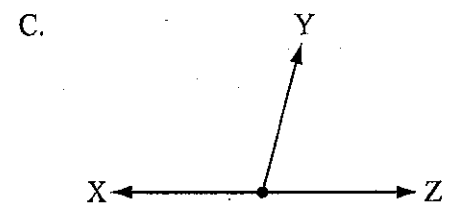
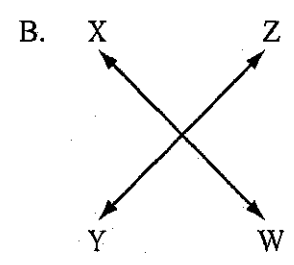
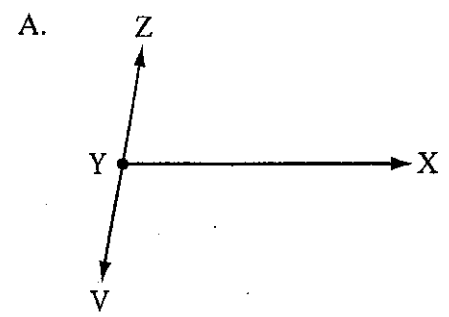
- A. 5.0 cm
- B. 5.8 cm
- C. 7.2 cm
- D. 10.0 cm

Maria is observing a woodpecker near the top of a tree, as shown in the diagram below.

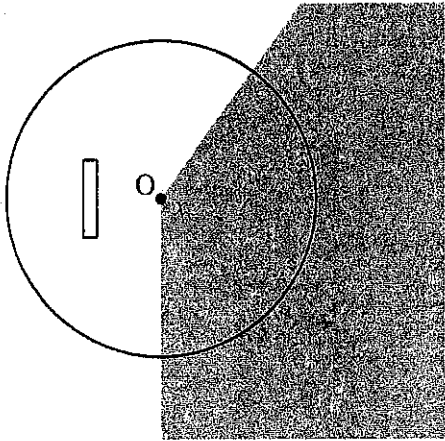


1. What is the distance between Maria and the woodpecker? Show all of your work, and round to the nearest foot.
2. What is the measure of angle x , the angle of elevation, rounded to the nearest degree? Show all of your work to justify your answer.

1) Which of the following figures contains $\angle XYZ$?



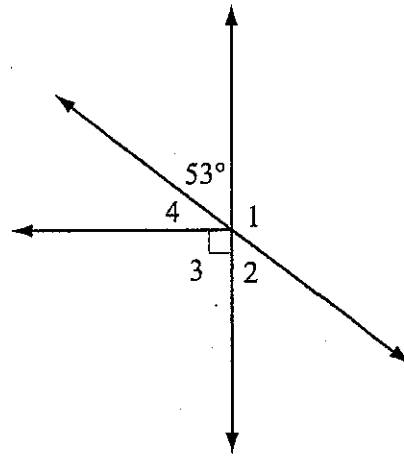
- 2.) The stands at a baseball stadium cast a shadow that covers $\frac{2}{5}$ of the pitcher's mound, with two sides of the shadow meeting at the center of the mound, shown below.



What is the measure of the smaller angle x made by the two sides of the shadow?

- A. 72°
- B. 144°
- C. 216°
- D. 288°

- 3.) Use the drawing below for this problem.



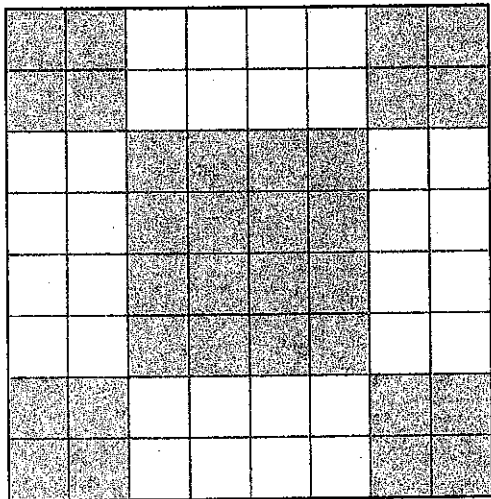
Which of the following angles has a measurement equal to 127° ?

- A. $\angle 1$
- B. $\angle 2$
- C. $\angle 3$
- D. $\angle 4$

- 4.) Sarah is building an exercise ramp for her hamsters. She plans to use a triangular frame for the ramp and has several pieces of wood to choose from. Which lengths of wood can Sarah use to form a triangle?

- A. 5 in., 8 in., 13 in.
- B. 5 in., 9 in., 15 in.
- C. 6 in., 8 in., 15 in.
- D. 6 in., 9 in., 12 in.

- 5.) In a game of chance, a computer randomly places a dot in one of the 64 squares shown below. If the dot falls inside a white square, the player loses the game.



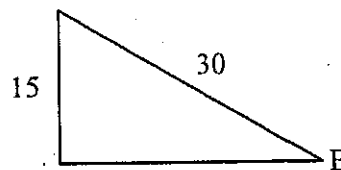
Rounded to the nearest percent, what is the probability that the person playing the game will lose?

- A. 32%
 B. 50%
 C. 64%
 D. 80%
- 6.) Which statement is false in Euclidean geometry but is true in spherical geometry?
- A. Every pair of vertical angles is congruent.
 B. The sum of the angles of any triangle is 180° .
 C. A triangle cannot have more than one right angle.
 D. Two intersecting lines intersect in exactly two points.

- 7.) Which of the following is the equation of a line perpendicular to the line whose equation is $y = \frac{1}{3}x + 2$ and passing through the point $(6, -10)$?

- A. $y = -3x + 8$
 B. $y = -\frac{1}{3}x - 8$
 C. $y = \frac{1}{3}x - 12$
 D. $y = 3x - 28$

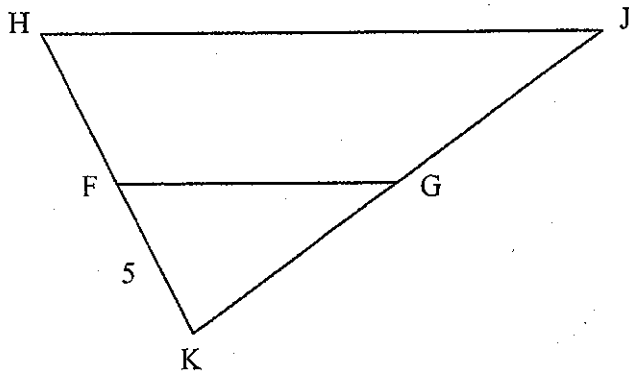
- 8.) Use the figure below to answer the following question.



If the above triangle is a right triangle and the hypotenuse is 30 units long, what is the measure of $\angle B$?

- A. 60°
 B. 45°
 C. 30°
 D. 15°

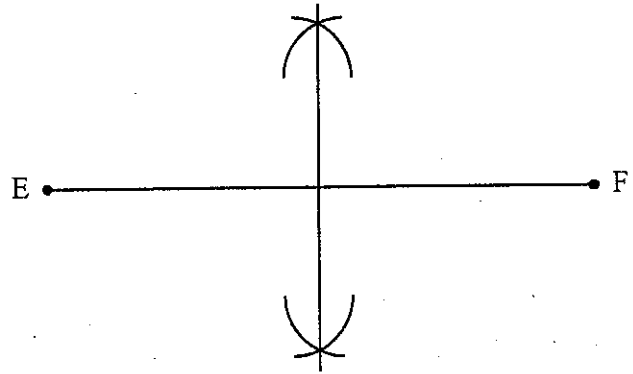
9.) In the figure below, $\overline{FG} \parallel \overline{HJ}$ and $HK = 2FK$.



Which of the following is true?

- A. $GK = 5$
- B. $GK > GJ$
- C. $GF = HJ$
- D. $GK = GJ$

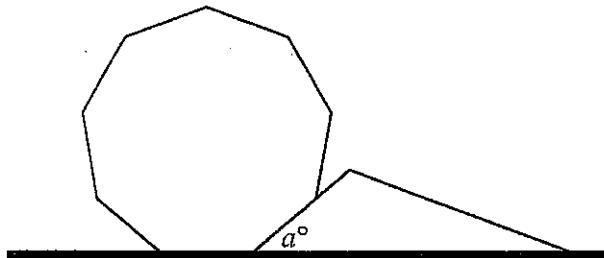
10.) Michelle puts the sharp point of her compass on point E of the 12-cm line segment \overline{EF} . She draws one arc above \overline{EF} and another arc below \overline{EF} , repeating this process with the sharp point of her compass on point F and then drawing a line perpendicular to \overline{EF} as shown.



What is the distance between point E and the perpendicular line?

- A. 3 cm
- B. 4 cm
- C. 6 cm
- D. 9 cm

- 11.) A stained-glass artist cuts pieces of glass in the shapes of a regular nonagon and a triangle to use along the straight edge of a window he is building.



What is the value of a ?

- A. 12°
B. 40°
C. 60°
D. 140°
- 12.) Oliver uses a tabletop chess set as a model to build an oversized chess set in a park. Each king in the tabletop set is 8 cm tall. Each king in the park set is 1.2 m tall. Each pawn in the tabletop set is 4.5 cm tall. What is the height of each pawn in the park set?
- A. 0.150 m
B. 0.675 m
C. 1.778 m
D. 5.400 m

- 13.) Barney drew a quadrilateral with the following characteristics.

- Only two of the four sides are congruent.
- The diagonals do not bisect each other.
- Only two of the four sides are parallel.

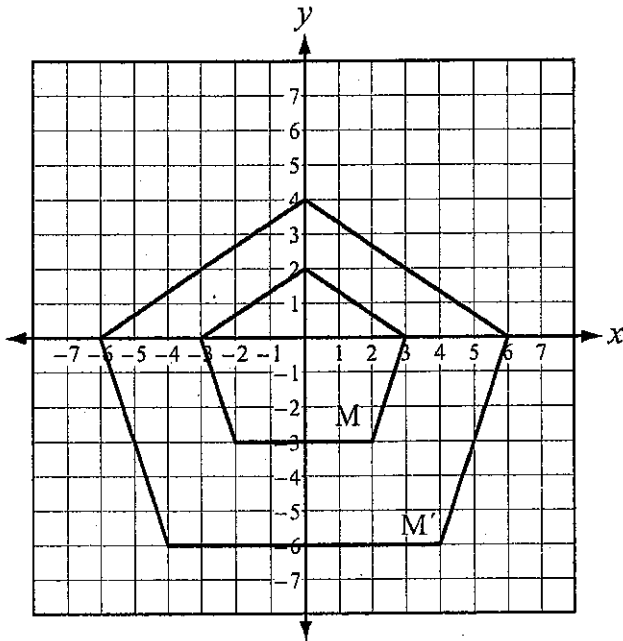
What type of quadrilateral did Barney draw?

- A. kite
B. square
C. rhombus
D. trapezoid

- 14.) A cone has a height of 14 centimeters and a base radius of 3 centimeters. What is its volume? Round your answer to the nearest cubic cm.

- A. 28 cm^3
B. 57 cm^3
C. 132 cm^3
D. 396 cm^3

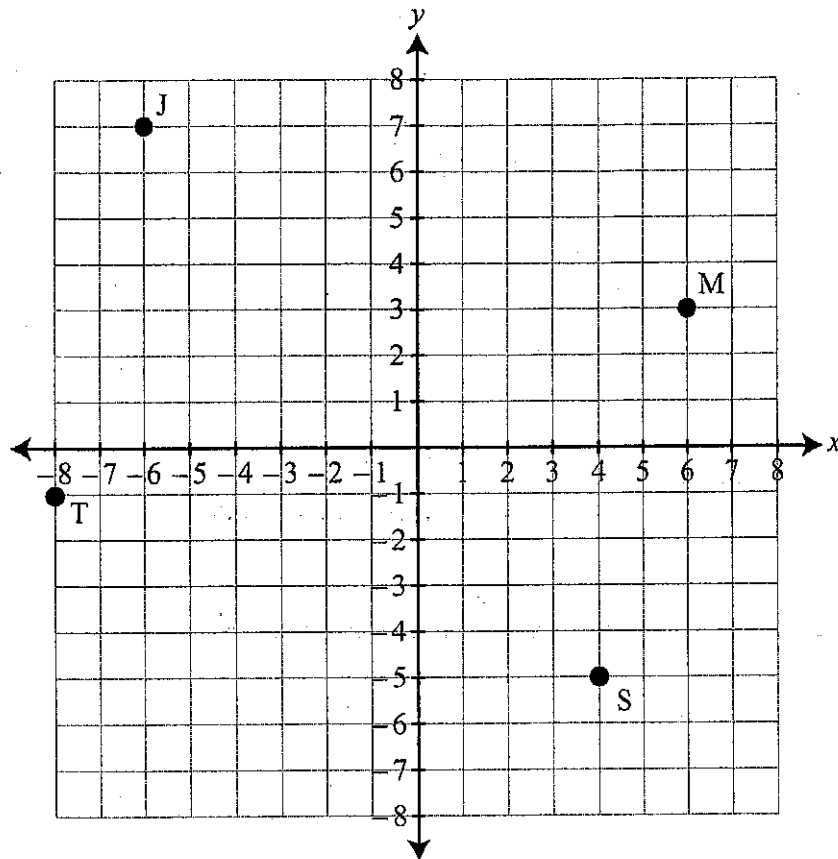
15.) The transformation of pentagon M to pentagon M' is shown below.



Which of the following is the correct name for the transformation?

- A. dilation
- B. rotation
- C. reflection
- D. translation

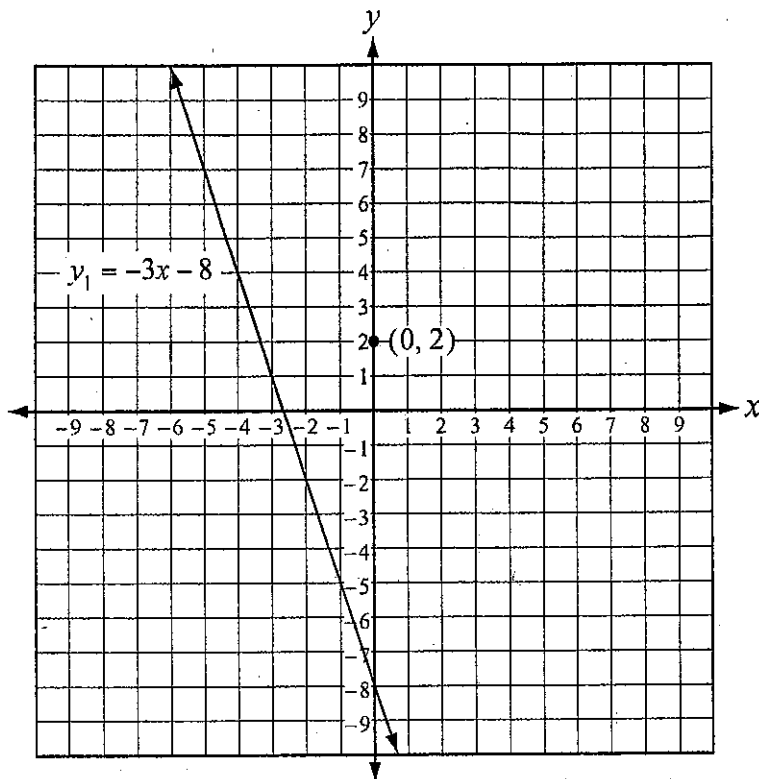
The marching band director is using a coordinate grid to help him design a formation for the marching band. He begins by placing the four section leaders, Jodi, Mark, Sandra, and Terrence, at the locations J, M, S, and T, as shown below.



1. The band director wants to place another key band member, Zach, halfway between Sandra (S) and Terrence (T). What will be the coordinates of Zach's location? Show your work or explain how you found your answer.
2. The band director plans to scale the graphic as 1 grid unit = 3 yards. How far, in yards, will Sandra be from Jodi? Round your answer to the nearest tenth of a yard. Show your work and/or explain how you found your answer.
3. Except for Zach, the other band members will be placed along the segments from Jodi to Sandra and from Mark to Terrence. Determine whether these two segments, \overline{JS} and \overline{TM} , are perpendicular. Show your work or explain how you found your answer.



1. Look at the coordinate plane below.



What is the equation of a line perpendicular to line y_1 and passing through $(0, 2)$?

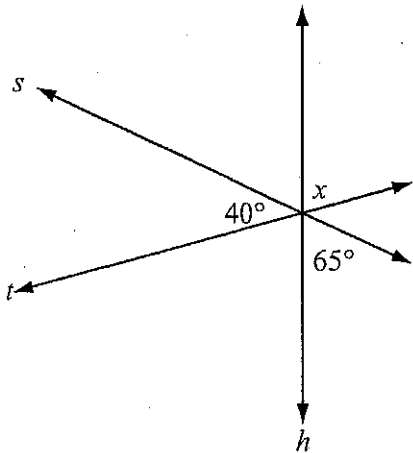
- A. $y = \frac{1}{3}x + 2$
- B. $y = -3x + 2$
- C. $y = 3x - 2$
- D. $y = -\frac{1}{3}x - 2$

2. The equation below describes a circle.

$$(x-5)^2 + (y+2)^2 = 16$$

What circle could this equation represent?

- A. a circle with center $(-2, 5)$ and radius 4
 - B. a circle with center $(5, -2)$ and radius 4
 - C. a circle with center $(5, -2)$ and radius 16
 - D. a circle with center $(-2, 5)$ and radius 16
3. What is the value of x ?



- A. 40°
- B. 65°
- C. 75°
- D. 105°

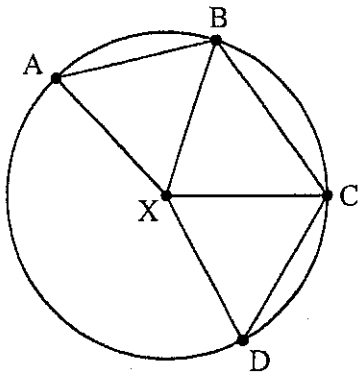
4. At Fulton Middle School, students' schedules follow these rules:

- If a student has Math during first period, the student must have PE before lunch.
- If a student has PE before lunch, the student must have English after lunch.
- Students eat lunch between third period and fourth period.
- A school day has six periods.

Michelle's first-period class is Math. Which conclusion must be true?

- A. Michelle has PE during third period.
- B. Michelle has PE during fourth, fifth, or sixth period.
- C. Michelle has English during sixth period.
- D. Michelle has English during fourth, fifth, or sixth period.

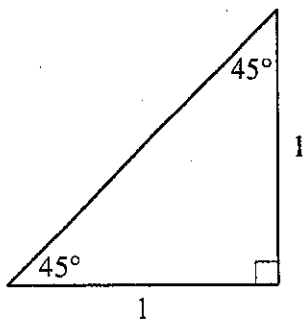
5. In circle X below, $\angle AXB \cong \angle CXD$.



Which **must** be true?

- A. $\overline{AB} \cong \overline{BX}$
- B. $\overline{AB} \cong \overline{CX}$
- C. $\overline{CD} \cong \overline{AB}$
- D. $\overline{CD} \cong \overline{CX}$

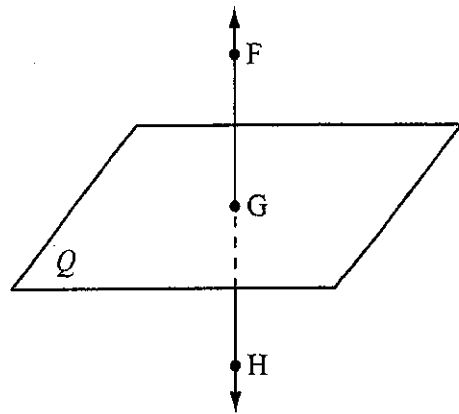
6. Look at the triangle below.



What is the length of the hypotenuse in the triangle?

- A. 1
- B. $\sqrt{2}$
- C. 2
- D. $2\sqrt{2}$

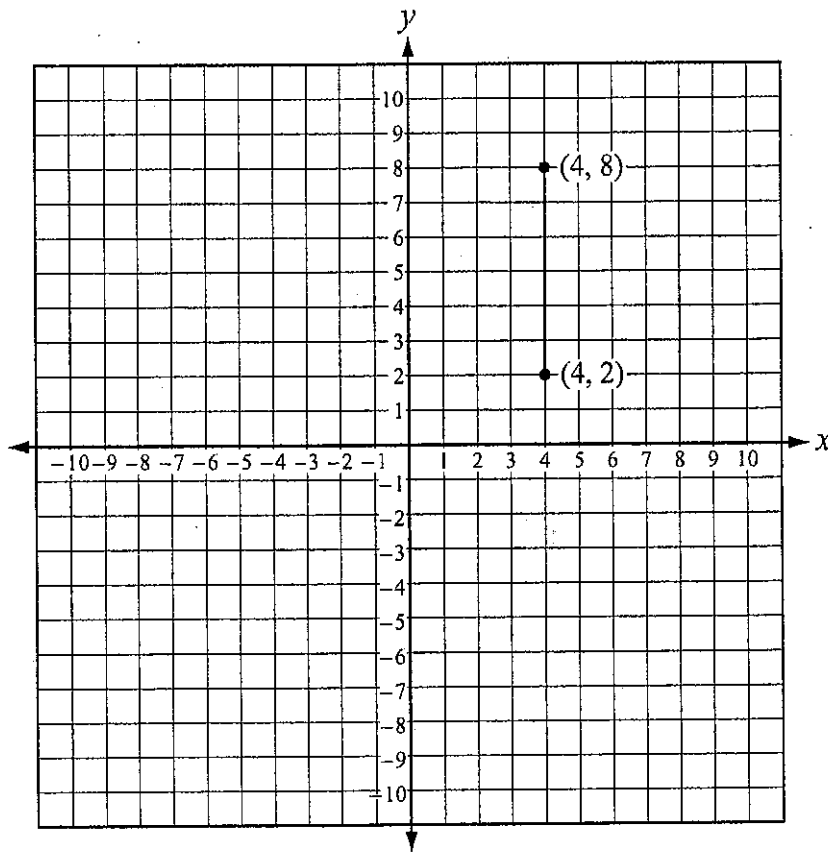
7. Look at the figure below.



What represents the intersection of plane Q and \overline{FH} ?

- A. \overline{FG}
- B. \overline{QG}
- C. $\angle QGF$
- D. point G

8. Look at the coordinate plane below.



What is the equation for the perpendicular bisector of the segment shown above?

- A. $y = 5$
- B. $x = 5$
- C. $y = 4$
- D. $x = 4$

9. A cylindrical oatmeal container has a height of 13 inches and a radius of 3.5 inches. What is the approximate volume of oatmeal that the container will hold?

- A. 286 in.³
- B. 363 in.³
- C. 500 in.³
- D. 1,592 in.³

10. Which is another name for a quadrilateral with four congruent sides and four right angles?

- A. square
- B. rectangle
- C. rhombus
- D. parallelogram

13. A glassblower starts with a solid cylindrical glass rod 150 millimeters long with a diameter of 24 millimeters. After heating the rod, the glassblower works it until it is 225 millimeters long. The rod's diameter is unchanged. Which is the best estimate of the increase in the surface area of the rod?

- A. 75 mm^2
- B. $5,655 \text{ mm}^2$
- C. $11,310 \text{ mm}^2$
- D. $33,929 \text{ mm}^2$

14. Use the graphs below to answer this question.

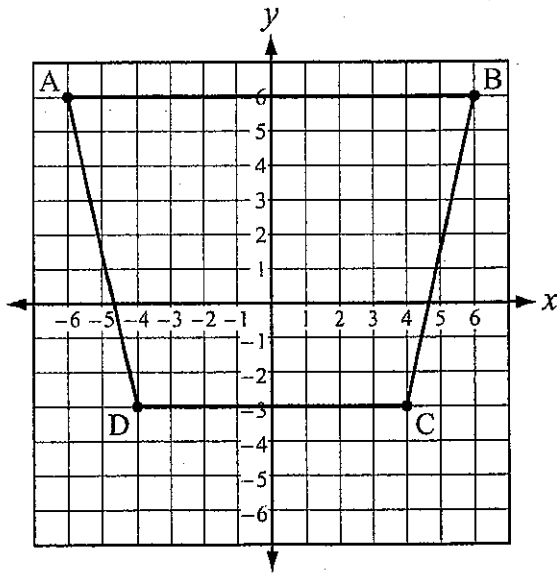


Figure 1

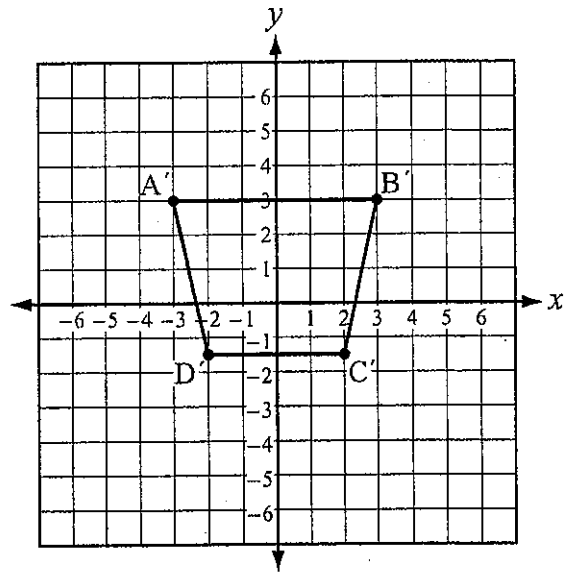
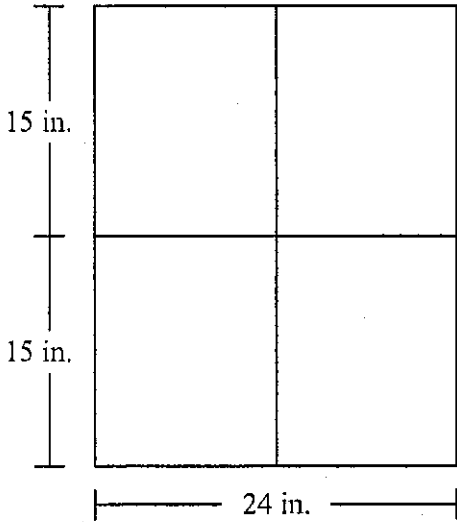


Figure 2

Which type of transformation is shown from Figure 1 to Figure 2?

- A. dilation
- B. rotation
- C. reflection
- D. translation

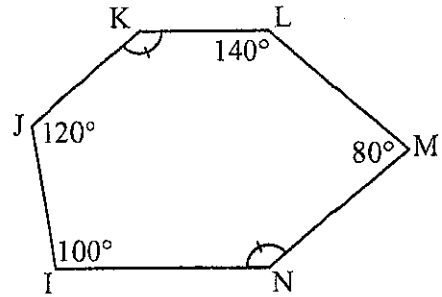
15. Mary Ann's rectangular window is 24 in. wide and 30 in. long. The window has 4 panes that are similar to the window.



If the length of each pane is 15 in., what is the width of each pane?

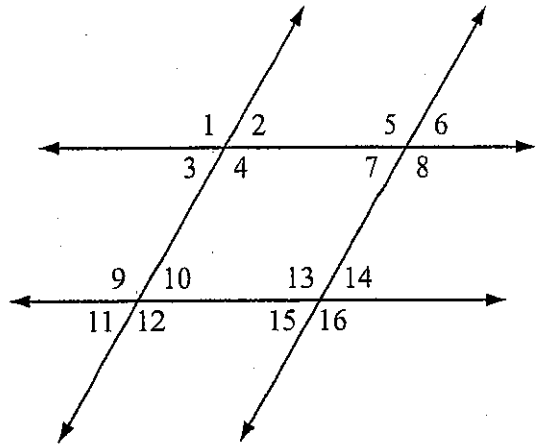
- A. 12 in.
- B. 15 in.
- C. 24 in.
- D. 30 in.

16. In the figure below, what is $m\angle N$?



- A. 90°
- B. 110°
- C. 120°
- * D. 140°

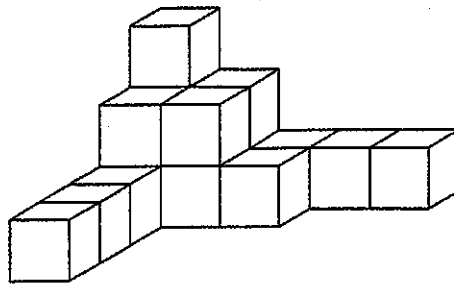
17. Two sets of parallel lines are shown below.



Which statement must be true?

- * A. $\angle 1 \cong \angle 12$
- B. $\angle 1 \cong \angle 14$
- C. $m\angle 5 + m\angle 9 = 180^\circ$
- D. $m\angle 10 + m\angle 11 = 90^\circ$

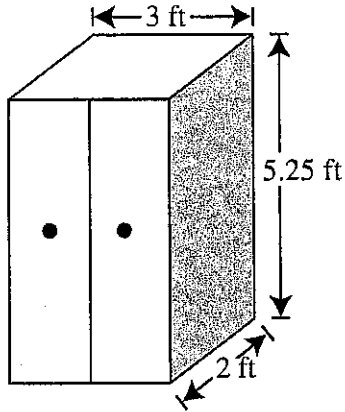
A. An arrangement of blocks sitting on a surface is shown below.



Front

1. Draw the view of the blocks from the right side.
2. Draw the view of the blocks from the top.
3. How many blocks in all are in the arrangement?
4. The length of each side of the cube-shaped blocks is 3 cm. What is the volume of the arrangement of blocks? Show your work.

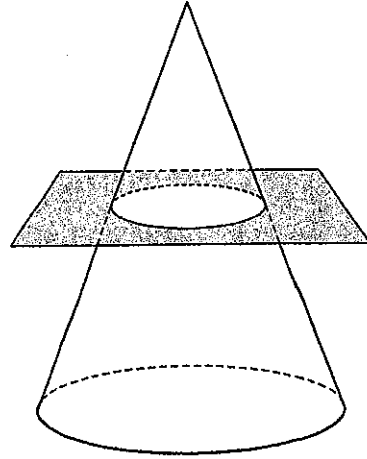
- 1.) The storage cabinet shown below is in the shape of a rectangular solid.



All six faces of the storage cabinet are to be painted. What is the surface area of the storage cabinet to the nearest hundredth of a square foot?

- A. 31.50
- B. 32.25
- C. 63.00
- D. 64.50

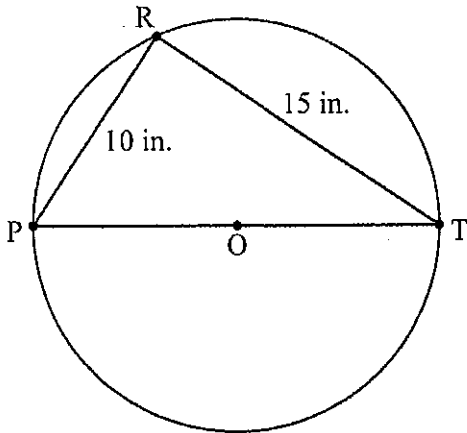
- 2.) Look at the figure below.



What shape is the cross-section of the cone?

- A. point
- B. circle
- C. triangle
- D. rectangle

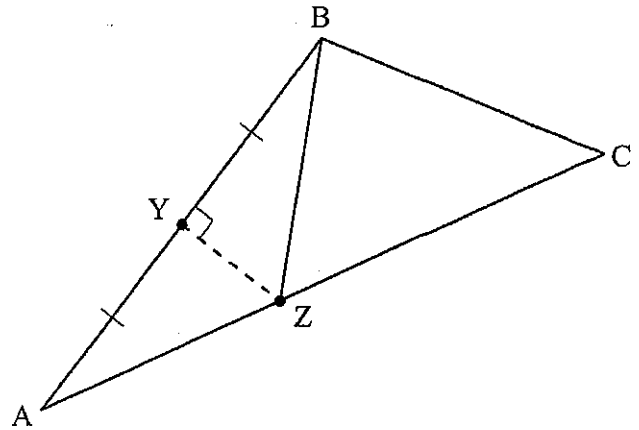
- 3) In the figure below, $\triangle PRT$ is inscribed in circle O.



What is the length of diameter \overline{PT} ? Round your answer to the nearest tenth.

- A. 11.2 in.
- B. 12.5 in.
- C. 17.3 in.
- D. 18.0 in.

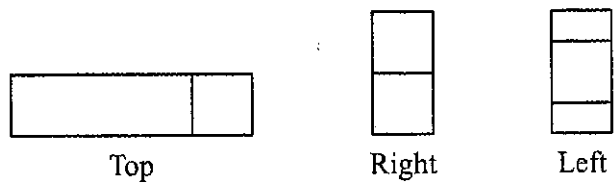
- 4) The drawing below shows $\triangle ABC$. \overline{YZ} is perpendicular to \overline{AB} , and $\overline{AY} \cong \overline{BY}$.



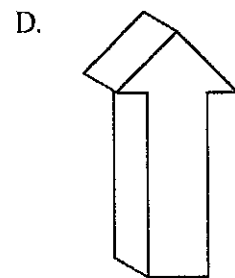
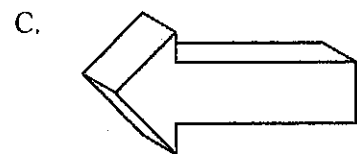
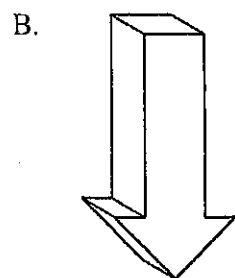
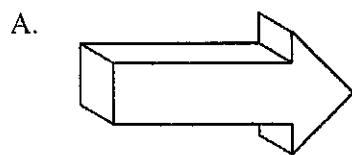
Which conclusion does this evidence support?

- A. $\triangle ABZ \sim \triangle ABC$
- B. $\triangle AYZ \cong \triangle BYZ$
- C. $\overline{BZ} \cong \overline{BC}$
- D. $\angle BZC \cong \angle BCZ$

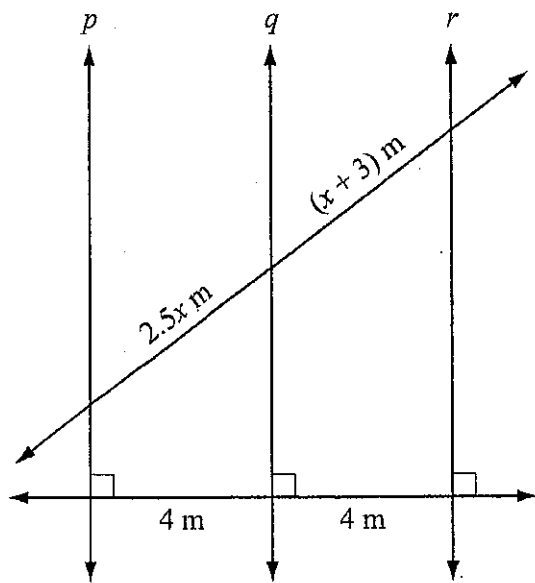
5.) Three views of a figure are shown below.



Which could be the figure shown in the three views?



10.) Look at the figure below.



What is the value of x ?

- A. 1.0
- B. 1.6
- C. 2.0
- D. 5.0

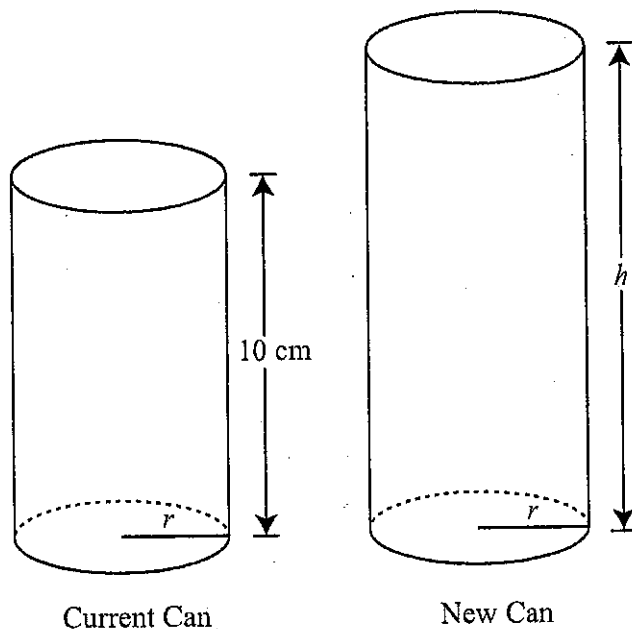
11.) Alex and three of his friends are all different ages.

- Lauren is older than Alex.
- Breanna is the oldest of the friends.
- Meghan is younger than Breanna but older than Lauren.

Which shows the correct order of the friends from oldest to youngest?

- A. Breanna, Meghan, Lauren, and Alex
- B. Breanna, Lauren, Meghan, and Alex
- C. Breanna, Meghan, Alex, and Lauren
- D. Breanna, Lauren, Alex, and Meghan

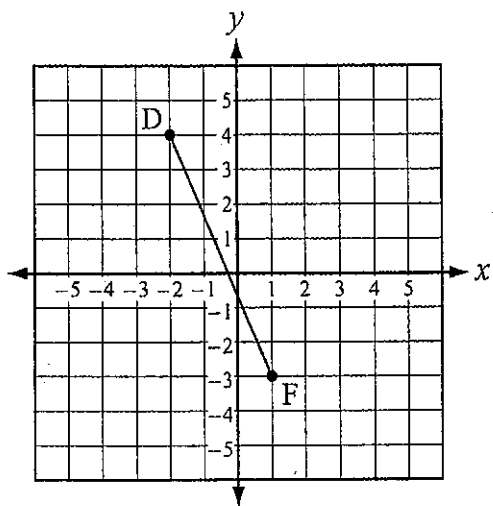
- 12) A potato chip manufacturer sells its potato chips in cylindrical cans. The current can has a volume of 300 cm^3 . They want to increase the size of the can to a volume of 400 cm^3 while keeping the radius the same.



What will be the height, h , of the new can? Round your answer to the nearest hundredth of a centimeter.

- A. 7.50 cm
- B. 10.75 cm
- C. 11.33 cm
- D. 13.33 cm

- 13.) E is the midpoint of \overline{DF} .

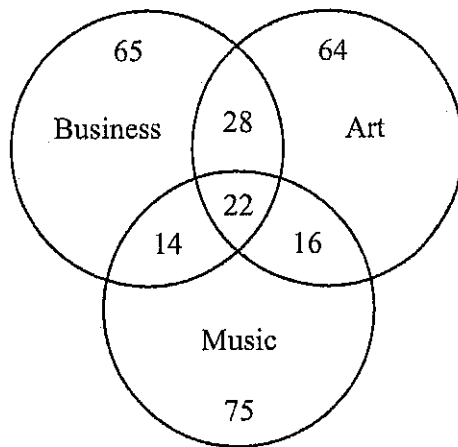


What are the coordinates of E?

- A. $\left(\frac{1}{2}, -\frac{1}{2}\right)$
- B. $\left(-\frac{1}{2}, \frac{1}{2}\right)$
- C. $\left(\frac{7}{2}, -\frac{3}{2}\right)$
- D. $\left(-\frac{3}{2}, \frac{7}{2}\right)$

A school requires all students to take an elective in Business, Art, and/or Music. The diagram below shows the distribution of students in the electives.

Student Enrollment in Electives

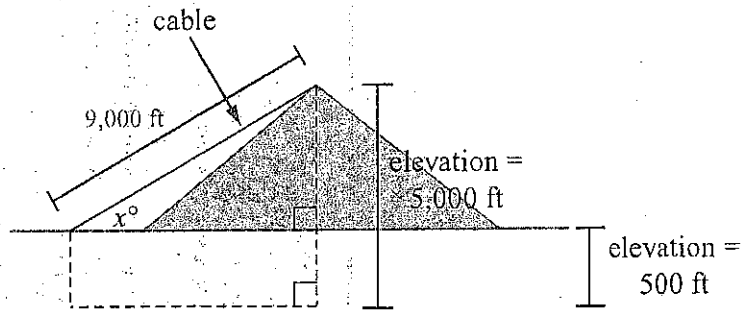


Four claims listed below are made about the distribution of students in the electives. For each claim, determine whether it is true or false. Justify your decision with mathematical reasoning.

1. More students signed up for Music electives than for Business electives.
2. More students are enrolled in two or more electives than are enrolled in only one elective.
3. More students are not enrolled in Music electives than are not enrolled in Art electives.
4. More students are in Art electives but not Business than are in Music but not Business.



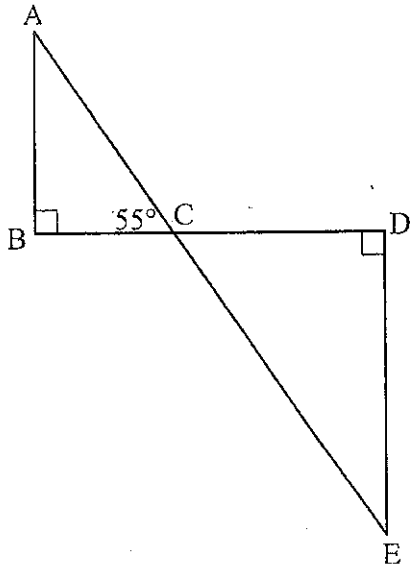
1. A cable car starts at an elevation of 500 feet above sea level and rises to the top of a peak that is 5,000 feet above sea level. The cable is 9,000 feet long.



What is x , the measure of the angle of elevation of the cable?

- A. 3°
- B. 6°
- C. 30°
- D. 33°

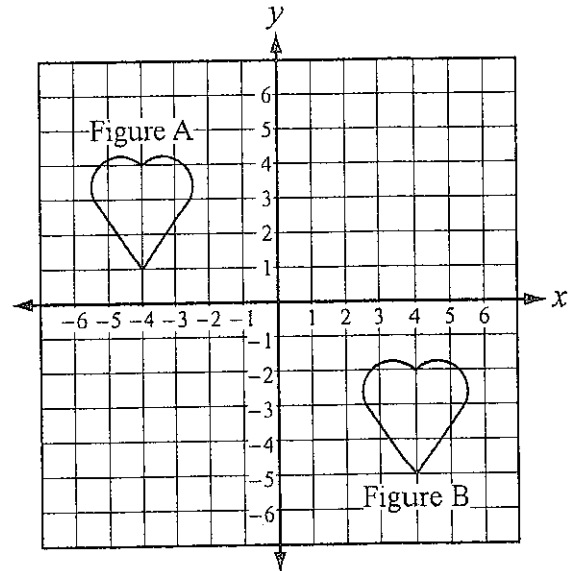
2. \overline{AE} is intersected by \overline{BD} at the point C, forming two right triangles, $\triangle ABC$ and $\triangle EDC$.



What is the measure of $\angle E$?

- A. 35°
- B. 45°
- C. 55°
- D. 90°

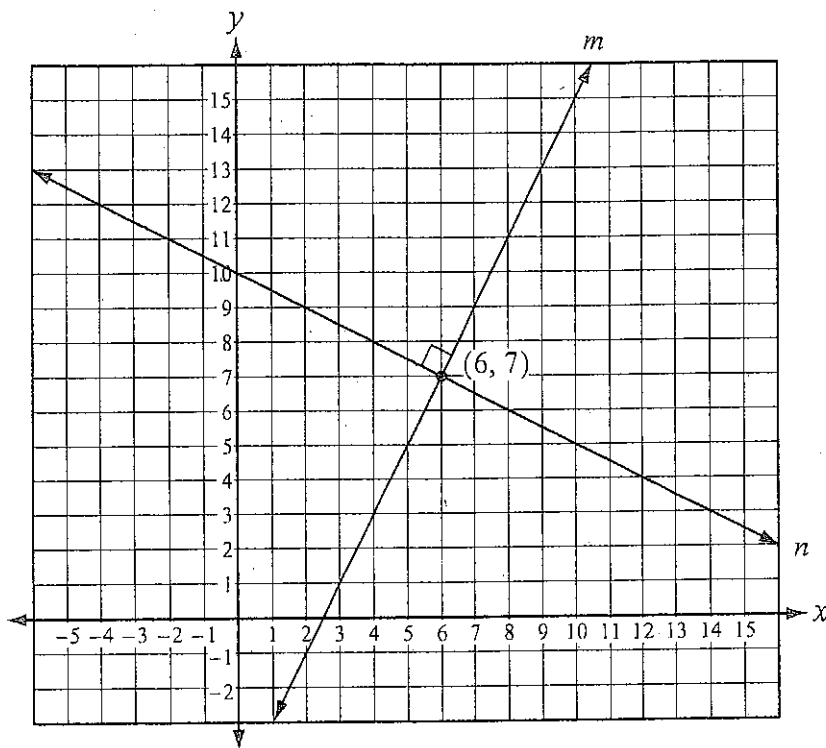
3. Look at the graph below.



Which best describes the transformation from Figure A to Figure B?

- A. translation 1 unit right and 1 unit down
- B. translation 8 units right and 6 units down
- C. translation 8 units right and 3 units down
- D. translation 6 units right and 8 units down

4. The coordinate grid below shows that line m and line n are perpendicular to each other.

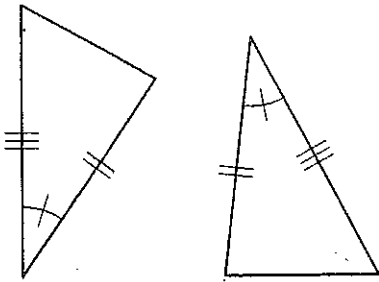


If the equation for line n is $y = -\frac{1}{2}x + 10$, then which is the equation for line m ?

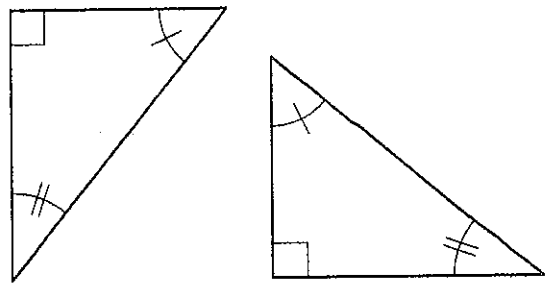
- A. $y = 2x - 8$
- B. $y = 2x - 5$
- C. $y = -2x + 19$
- D. $y = -2x + 20$

5. Which two triangles are congruent, according to the side-angle-side (SAS) theorem?

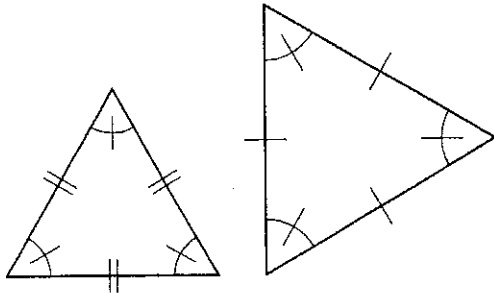
A.



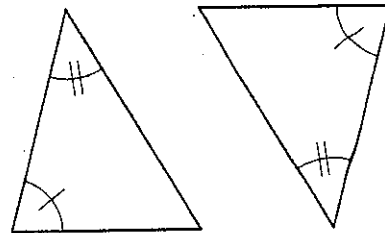
B.



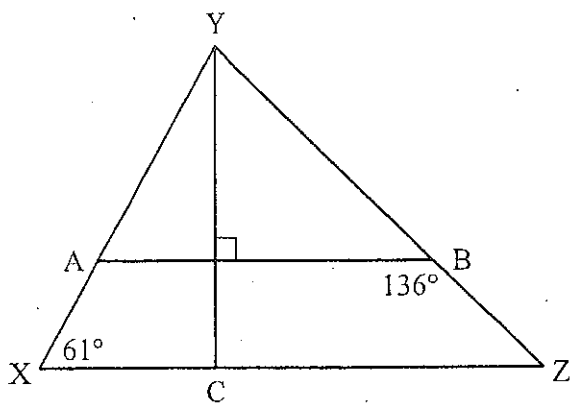
C.



D.



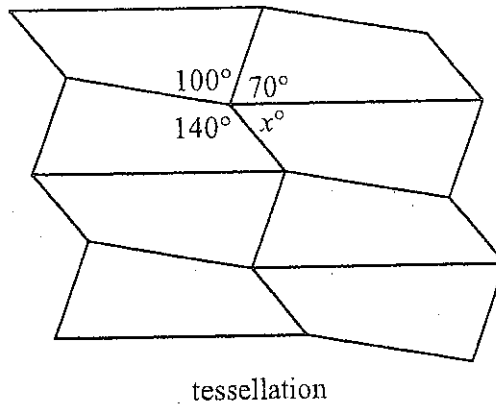
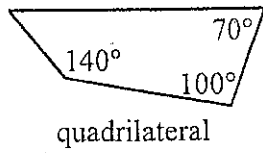
6. In the figure below, \overline{AB} and \overline{XZ} are parallel to each other.



What is the measure of $\angle XYC$?

- A. 29°
- B. 44°
- C. 46°
- D. 75°

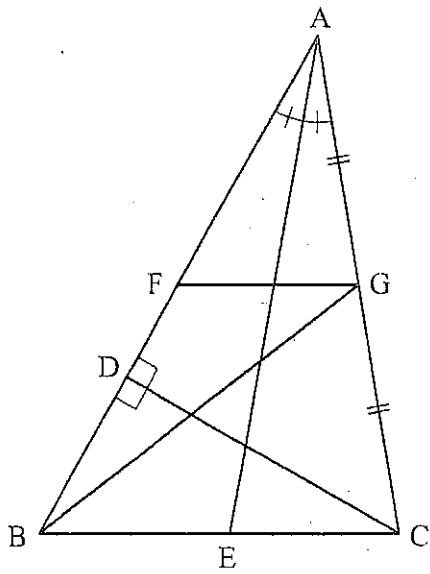
7. The figure below is a tessellation of a quadrilateral.



What is the value of x ?

- A. 20
- B. 40
- C. 50
- D. 100

8. Triangle ABC is shown below.



Which segment is an angle bisector?

- A. \overline{AE}
- B. \overline{BG}
- C. \overline{CD}
- D. \overline{FG}

9. On a globe, lines of longitude run north-south and lines of latitude run east-west. How many times do the Prime Meridian (0° longitude) and the Equator (0° latitude) intersect?

- A. 1
- B. 2
- C. 4
- D. 8

10. Each figure shown below is a square measuring 1 unit wide by 1 unit long.

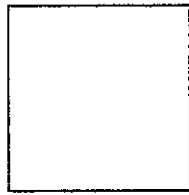


Figure 1

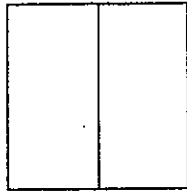


Figure 2

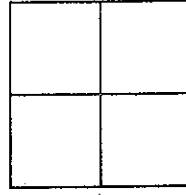


Figure 3

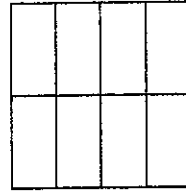
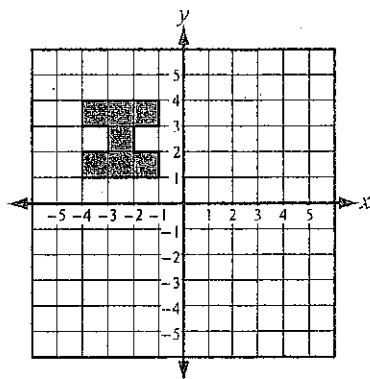


Figure 4

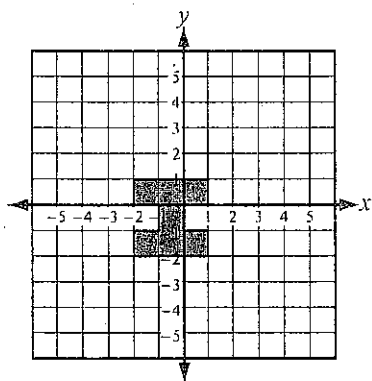
If the pattern continues, how many sections will make up Figure 8?

- A. 16 sections
- B. 32 sections
- C. 128 sections
- D. 256 sections

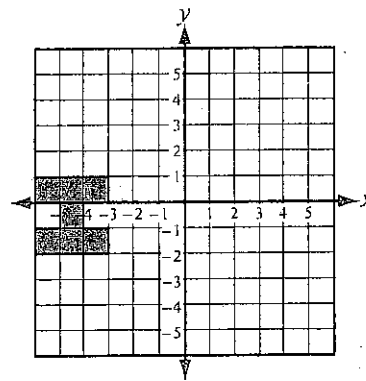
11. Which image will result from the figure below being translated three units down and two units to the right?



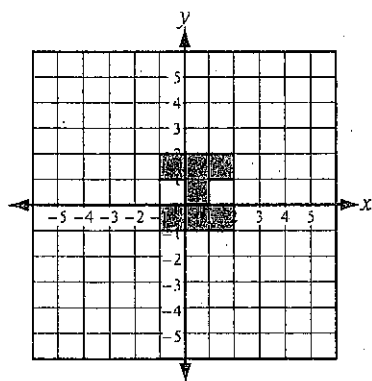
A.



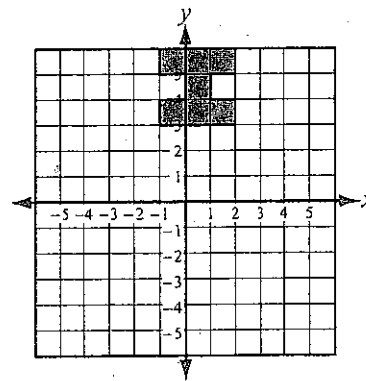
B.



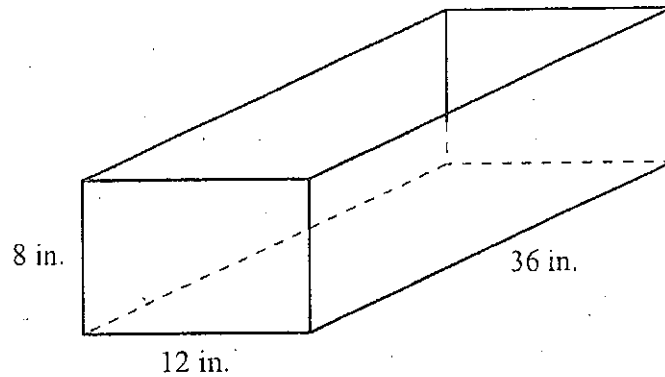
C.



D.



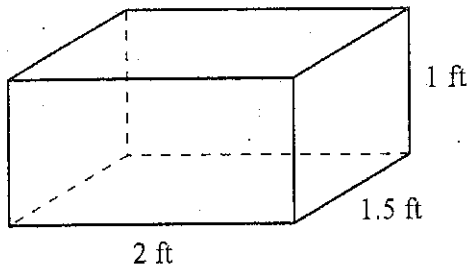
12. Maia makes flower boxes to sell at a farmer's market. One flower box is shown below.



Maia wants to make another flower box that has a length of 24 inches instead of 36 inches. What will be the difference in volumes of the two flower boxes?

- A. 480 in.³
 - B. 1,152 in.³
 - C. 2,304 in.³
 - D. 3,456 in.³
-

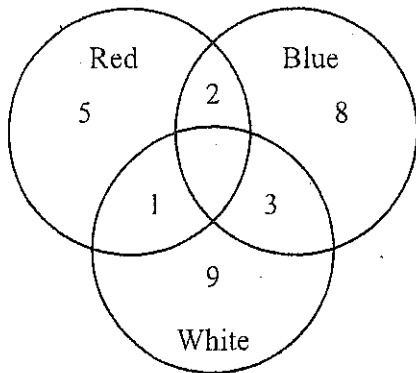
13. Max wants to wrap a box in the shape of a rectangular prism that is 2 ft long, 1 ft high, and 1.5 ft deep.



How much wrapping paper is needed to cover the exact surface area of the box?

- A. 3 ft²
- B. 4.5 ft²
- C. 6.5 ft²
- D. 13 ft²

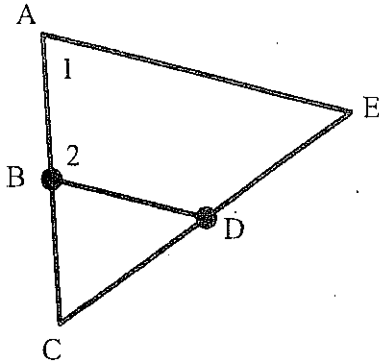
14. The Venn diagram below shows the colors of the cars in a school parking lot.



How many cars in the school parking lot are at least partly white?

- A. 9
- B. 10
- C. 12
- D. 13

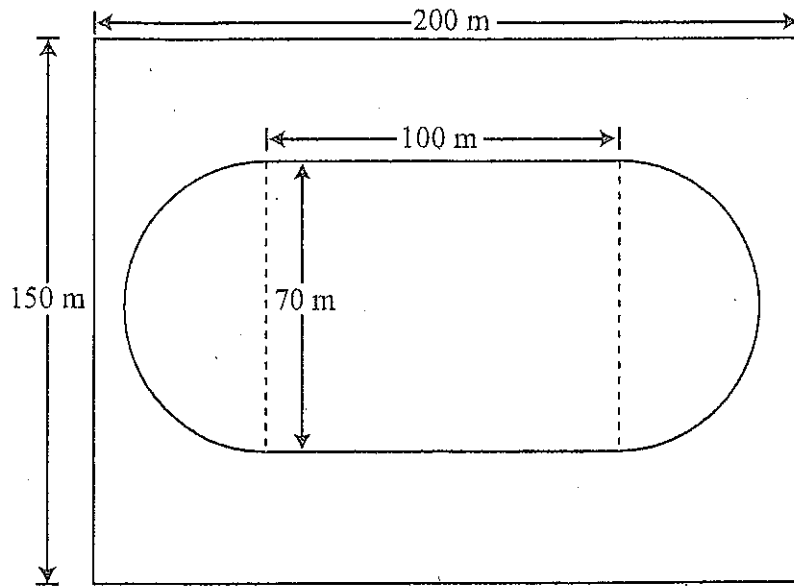
15. In the triangle shown below, point B is the midpoint of line \overline{AC} , and point D is the midpoint of line \overline{CE} .



Which conclusion is supported by the information above?

- A. $\angle 1$ and $\angle 2$ are straight angles.
- B. $\angle 1$ and $\angle 2$ are congruent angles.
- C. $\angle 1$ and $\angle 2$ are supplementary angles.
- D. $\angle 1$ and $\angle 2$ are complementary angles.

A rectangular field measuring 150 meters by 200 meters contains a running track. The area enclosed by the running track is in the shape of a rectangle with semicircles on each end, as illustrated below.



1. Determine the area enclosed by the running track. Round your answer to the nearest square meter. Show your work or explain how you found your answer.
2. A bag of supplies is dropped from a helicopter and lands on the field. Assuming the bag is equally likely to land anywhere in the field, what is the probability that the bag lands **outside** the area enclosed by the running track? Round your answer to the nearest whole percent. Show your work or explain how you found your answer.

