ACTAAP

Arkansas Comprehensive Testing, Assessment and Accountability Program

Released Item Booklet

Geometry
Mid-Year End-of-Course Examination

January 2006 Administration

Arkansas Department of Education

PART II   Released Geometry Items

1. Phil created a design with a circle inscribed in a triangle. What is the relationship between any one side of the triangle and the circle?

   A.   The side is a radius of the circle.

   B.   The side is a chord of the circle.

   * C.   The side is a tangent of the circle.
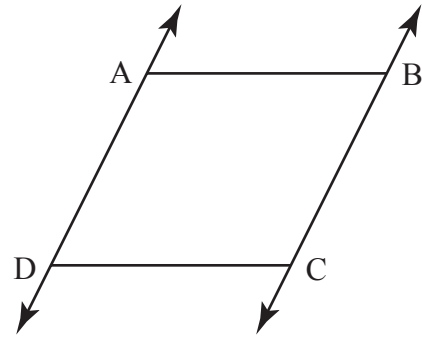
   D.   The side is a secant of the circle.

Use the figure below to answer question 2.

5 in.
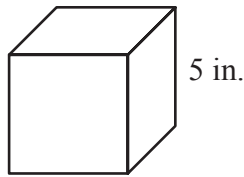
(Not drawn to scale.)

2. What is the total surface area of the cube shown above?

   A.   25 in.^{2}

   B.   100 in.^{2}

   C.   125 in.^{2}

   * D.   150 in.^{2}

3. The point (1, 2) is the midpoint of a line segment whose one endpoint is (–3, 6). What is the other endpoint of the line segment?

   A.   (–7, 10)

   B.   (–1, 4)

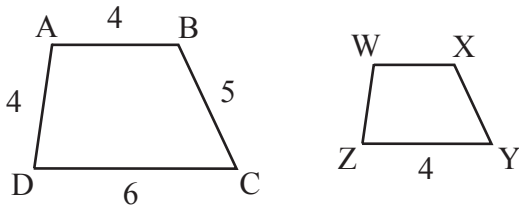   C.   (4, –4)

   * D.   (5, –2)

Use the figure below to answer question 4.

4. ABCD is a parallelogram. The equation of $\overleftrightarrow{AD}$ is $y = \dfrac{5}{3}x + 6$. Which could be the equation of $\overleftrightarrow{BC}$?

   A. $y = -\dfrac{5}{3}x + 2$

   B. $y = -\dfrac{3}{5}x + 1$

   C. $y = \dfrac{3}{5}x + 4$

   * D. $y = \dfrac{5}{3}x + 3$

5. Joe's garden is the shape of a hexagon. The measures of 5 of the angles are: 160°, 90°, 60°, 160°, and 80°. What is the measure of the remaining angle?

   A.   110°

   B.   120°

   C.   160°

   * D.   170°

Use the figures below to answer question 6.

(Not drawn to scale.)

6. For an art project, Mari drew the two similar figures shown above. How long is $\overline{XY}$?

   A.   3

 * B. $3\dfrac{1}{3}$

   C. $4\dfrac{4}{5}$

   D. $7\dfrac{1}{2}$

7. Mark's garden has four rows of vegetables. Each row has a different vegetable: beets, carrots, lettuce, potatoes.

- The beets are in a lower-number row than the potatoes.
- The carrots are in a higher-number row than the potatoes.
- The lettuce are in a higher-number row than the carrots.

What is the correct order from the lower number row to higher number row?

   A.   beets, carrots, lettuce, potatoes

   B.   beets, potatoes, lettuce, carrots

   C.   beets, carrots, potatoes, lettuce

 * D.   beets, potatoes, carrots, lettuce

Use the figure below to answer question 8.
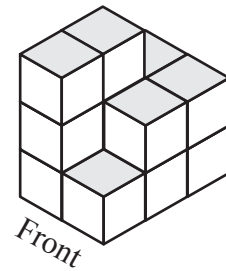
8. No stacks of blocks are hidden in the figure above. Which is the top view?

   A.

   B.

 * C.

   D.
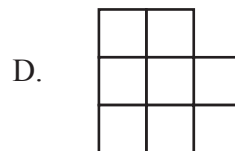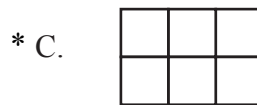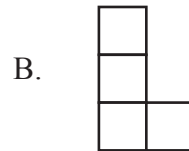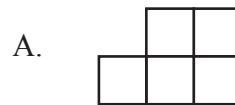
9. Julie designed a tabletop in the shape of a regular pentagon. Mr. Robinson, her teacher, suggests that she redesign it as a regular hexagon. By how much would each interior angle change?

 * A.   12°

   B.   30°

   C.   36°

   D.   180°

10. Belize, Costa Rica, El Salvador, and Guatemala are countries in Central America.

- Belize has less land area than Guatemala.
- Costa Rica has more land area than Belize.
- El Salvador has less land area than Belize.
- Guatemala has more land area than Costa Rica.

What is the correct order **from smallest** land area **to largest** land area?

A.   Belize, Costa Rica, El Salvador, Guatemala

* B.   El Salvador, Belize, Costa Rica, Guatemala

C.   Guatemala, Costa Rica, Belize, El Salvador

D.   El Salvador, Costa Rica, Belize, Guatemala
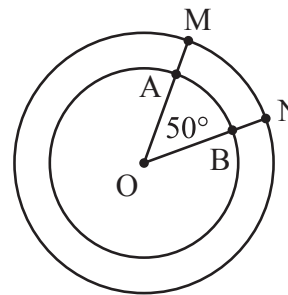
Use the figure below to answer question 11.

A   B

1

70°

3   2

D   C
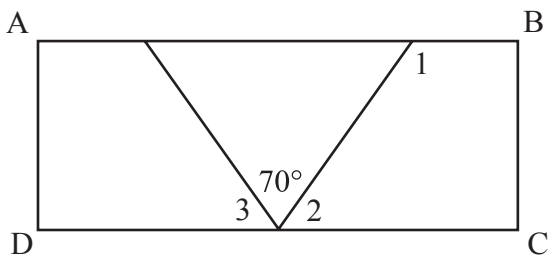
(Not drawn to scale.)

11. ABCD is a rectangle. $\angle 2$ and $\angle 3$ are congruent. What is the measurement of $\angle 1$?

A.   55°

B.   70°

C.   110°

* D.   125°

Use the figure below to answer question 12.

M

A

50°   N

O   B

(Not drawn to scale.)

12. The two concentric circles shown in the figure above represent the tire and rim of a wheel on a wagon. The measure of $\angle$ AOB is 50°. What is the measure of $\overset{\frown}{MN}$?

* A.   50°

B.   100°

C.   150°

D.   200°

13. Jay is building a playhouse. His scale drawing is 8 inches wide and 12 inches long. The playhouse is 9 feet long. Using Jay's scale, how wide should the playhouse be?

A.   5 feet

* B.   6 feet

C. $10\dfrac{2}{3}$ feet

D. $13\dfrac{1}{2}$ feet

4

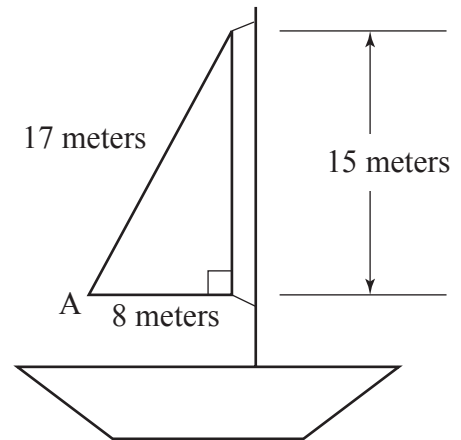**Use the table below to answer question 14.**

Arkansas Population

Year	Population (in millions)
1960	1.8
1970	1.9
1980	2.3
1990	2.4
2000	2.7

14. The table above shows that the Arkansas population increased each decade from 1960 through 2000. Therefore, the Arkansas population in the year 2010 will probably be greater than 2.7 million. What type of reasoning does this show?

   A.   circular reasoning

   B.   deductive reasoning

   C.   illogical reasoning

   * D.   inductive reasoning

15. Pita is painting a copy of a famous rectangular-shaped painting. The paintings will be similar rectangles. The famous painting is 28 in. wide. Pita's painting will be 8 in. wide. In the famous painting, the distance from one of the figures to the top of the canvas is 7 in. How far from the top should Pita paint the figure?

   A. $\dfrac{7}{8}$ in.

   B.   1 in.

   C. $\dfrac{8}{7}$ in.

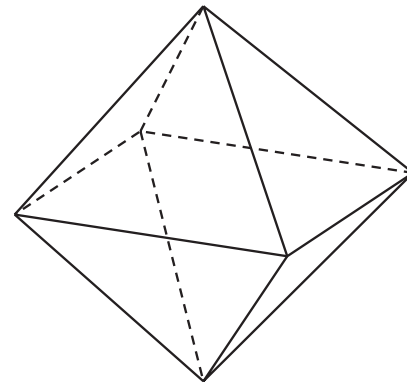   * D.   2 in.

Use the figure below to answer question 16.

17 meters

15 meters

A   8 meters

(Not drawn to scale.)

16. Using the dimensions of the sail given above, which most closely represents sin A?

   A.   0.4706

   * B.   0.8824

   C.   1.1333

   D.   1.8750

Use the figure below to answer question 17.

17. Tracy makes jewelry using beads in the shape of the polyhedron shown above. Which is the geometric name for the shape of the bead?

   A.   triangular pyramid

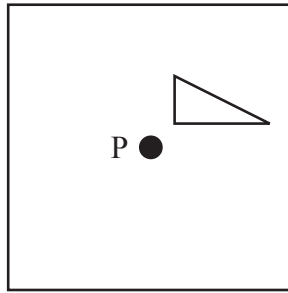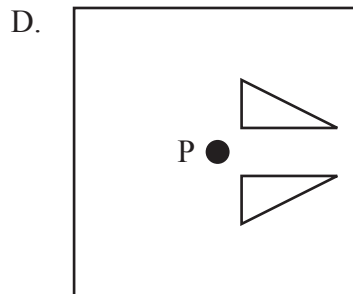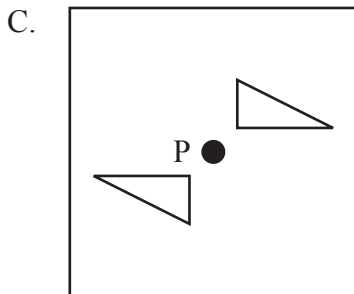   B.   triangular polygon

   * C.   octahedron

   D.   hexahedron

5

Use the figure below to answer question 18.

18. To plan a scene in an animated movie, Roger rotates the above figure around point P by 90° in a clockwise direction. Which drawing shows the pre-image and the final image?

A.

* B.

C.

D.
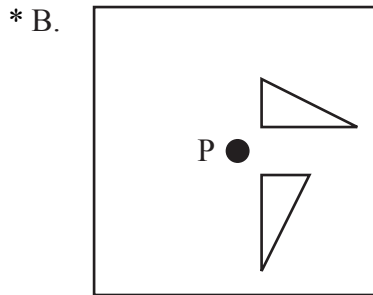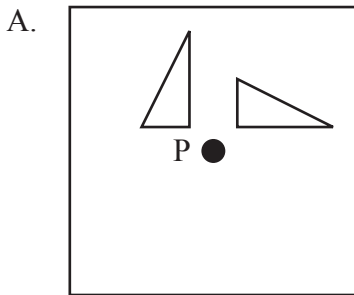
19. What is the relationship between the two lines $y = -\dfrac{4}{3}x + 6$ and $y = \dfrac{3}{4}x + 6$?

   A. intersecting, but not perpendicular

   B. parallel

   * C. perpendicular

   D. same line

20. Ann has a pool in the shape of a rectangular prism. The pool is 12 feet long, 18 feet wide, and 3 feet high. How much water, in cubic feet, does Ann need to fill the pool completely?

   A. 216

   B. 324

   C. 612

   * D. 648

Use the figure below to answer question 21.

25 yd.

15 yd.

20 yd.

45 yd.

(Not drawn to scale.)

21. Brian is going to plant lawn seed in his backyard shown above. Lawn seed is sold based on the area of the ground. What is the area of Brian's backyard?

   A.   1,225 yd.^{2}

   B.   1,350 yd.^{2}

* C.   1,425 yd.^{2}

   D.   1,575 yd.^{2}

Use the figure below to answer question 22.

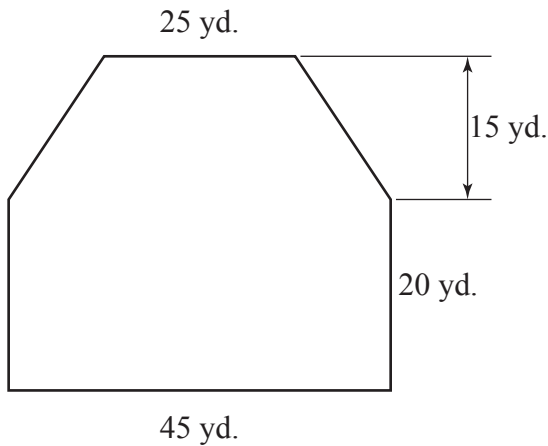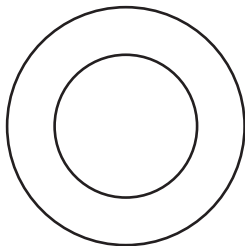(Not drawn to scale.)

22. The circumference of the plate shown above is 84.5 cm. To the nearest hundredth, what is the plate's diameter? Use $\pi = 3.14$.

   A.   5.19 cm

   B.   10.38 cm

   C.   13.46 cm

* D.   26.91 cm

23. Texarkana, Pine Bluff, Jonesboro, and Springdale are cities in Arkansas. The following statements give information about the amount of rainfall for 1 month.

- Texarkana received more rain than Springdale.
- Jonesboro received less rain than Pine Bluff.
- Pine Bluff received more rain than Texarkana.
- Jonesboro received less rain than Springdale.

Which orders the cities by the amount of rainfall received from least to greatest?

* A.   Jonesboro, Springdale, Texarkana, Pine Bluff

   B.   Springdale, Jonesboro, Texarkana, Pine Bluff

   C.   Jonesboro, Texarkana, Springdale, Pine Bluff

   D.   Jonesboro, Springdale, Pine Bluff, Texarkana

24. Which set of statements has a correct conclusion?

   A.   A radio plays music. Steve hears music. Therefore, Steve hears a radio.

   B.   Sue drives a car to work. Sue drove to the mall. Therefore, Sue works at the mall.

   C.   Lollipops are candy. Alice bought some candy for her class. Therefore, Alice bought lollipops for her class.

* D.   Everyone who went to the movie theater this weekend saw two movies. Julio did not see two movies this weekend. Therefore, Julio did not go to the movie theater this weekend.

Use the graph below to answer question 25.
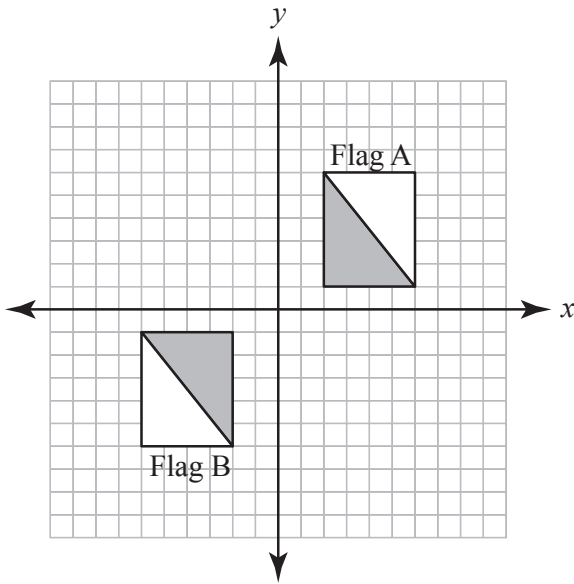
25. Which would move Flag A to Flag B in the graph above?

* A.   clockwise rotation of 180°

  B.   reflection over x-axis, then clockwise rotation of 90°

 C.   translation 8 units left and 7 units down

  D.   reflection over y-axis, then translation 8 units left and 7 units down

Use the information below to answer question 26.

- Tony has apples, bananas, and oranges in a shopping cart.
- The number of each item, in no particular order, is 5, 6, or 10.
- There are fewer bananas than apples.
- There are five oranges in the cart.

26. Which statement is true?

  A.   There are more oranges than bananas.

  B.   There are 10 bananas in the cart.

  C.   There are twice as many oranges as bananas.

* D.   There are twice as many apples as oranges.

Use the figure below to answer question 27.

$\square$ = 100 m²
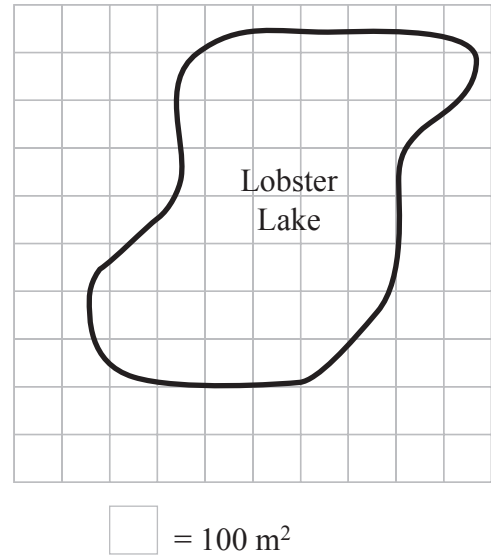
27. A scale drawing of Lobster Lake is shown above. Which is the best estimate of the area of Lobster Lake?

  A.   2,000 m²

  B.   3,000 m²

* C.   4,000 m²

  D.   5,000 m²

Use the statements below to answer question 28.

- If a person has a job, then that person has an income.
- If a person has an income, then that person must pay taxes.

28. What logical conclusion can be made from the statements above?

* A.   If a person has a job, then that person must pay taxes.

  B.   If a person does not have a job, then that person does not have to pay taxes.

  C.   If a person pays taxes, then that person must have a job.

  D.   If a person does not have a job, then that person does not have an income.

8

PART II   Released Geometry Items

Use the figures below to answer question 29.

Figure 1   Figure 2   Figure 3   Figure 4

1 triangle   4 triangles   9 triangles   16 triangles
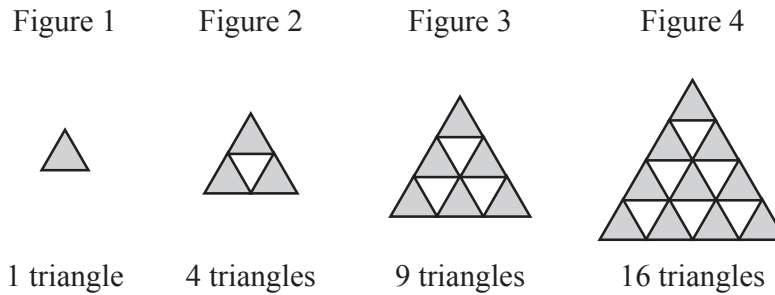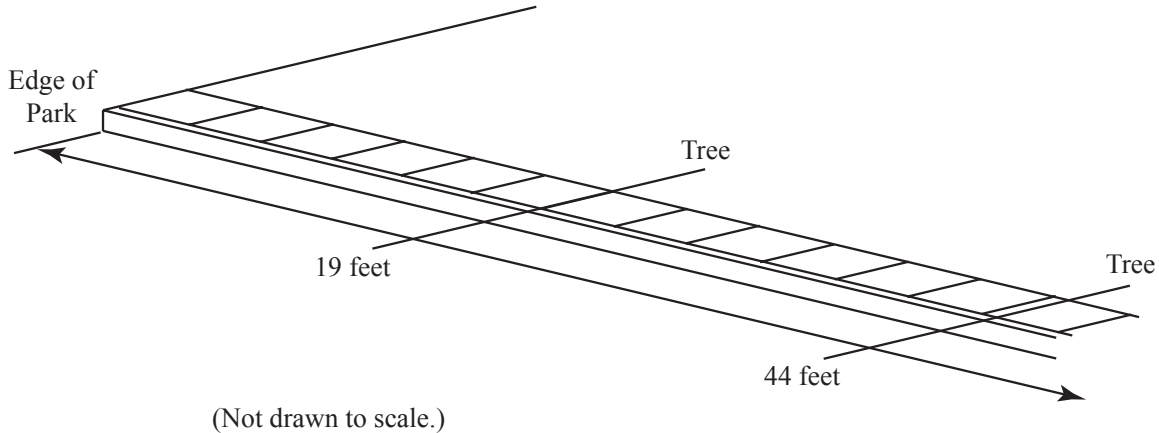
29. The number of triangles in the figures above form a pattern. What will be the total number of triangles in the Figure 5?

    A.   21
    B.   23
  * C.   25
    D.   27

Use the diagram below to answer question 30.

Edge of
Park

Tree

19 feet

Tree

44 feet

(Not drawn to scale.)

30. A straight sidewalk passes through a park. One tree is planted along the sidewalk 19 feet from the edge of the park as shown in the diagram above. Another tree is planted 44 feet from the edge of the park. A fountain will be built along the sidewalk at the midpoint between the two trees. How many feet from the edge of the park will the fountain be built?

    A.   12.5
    B.   22
    C.   25
  * D.   31.5

Use the figure below to answer question 31.

**Shawn's Scale Model**

15.5 in.

?

(Not drawn to scale.)

31. Shawn is making a scale drawing of a circular greenhouse that will be built near a square building, as shown in the figure above. In Shawn's scale drawing, the square building measures 15.5 in. on each side. The actual square building measures 50 ft. on each side. The actual circular greenhouse will have a diameter of 40 ft. What is the diameter of the circle in Shawn's scale drawing?

   A.   5.5 in.

   B.   6.2 in.

* C.   12.4 in.

   D.   19.4 in.

32. There are 25 students in Mr. Webster's class. There are 14 girls in the class. Twelve of the students play an instrument. Which statement **must** be true?

   A.   At least one boy plays an instrument.

   B.   All of the students who play an instrument are girls.

   C.   Over half of the students are boys.

* D.   At least one girl plays an instrument.

Use the figure below to answer question 33.
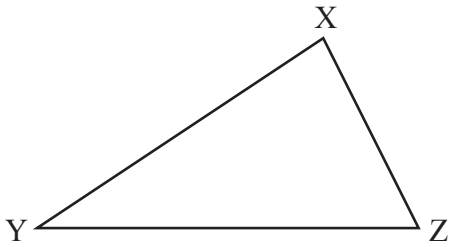
8 cm = width

18 cm = length
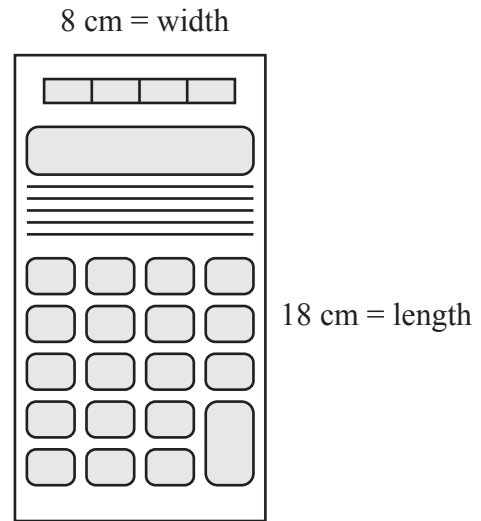
(Not drawn to scale.)

33. A calculator company plans to shrink the length of this calculator to 80% of its current length shown above. The width will not change. What will be the new area of the calculator face?

   A.   44.8 cm^2

   B.   92.16 cm^2
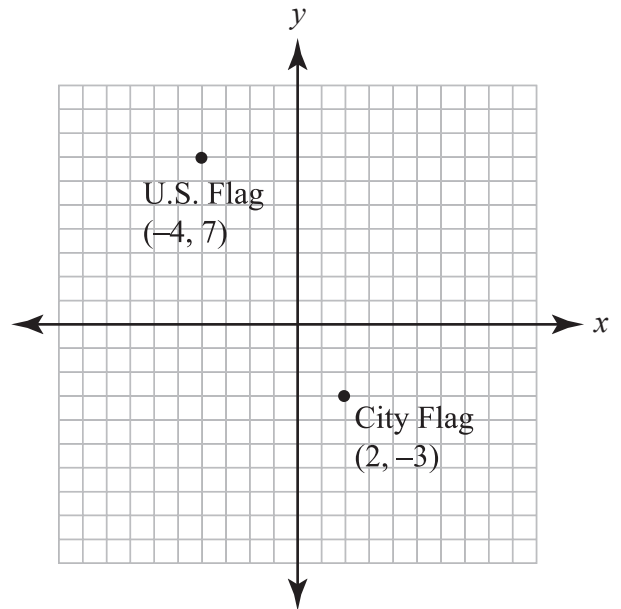
* C.   115.2 cm^2

   D.   144 cm^2

Use the figure below to answer question 34.

34. Which figure shows an altitude of △ XYZ?

A.

B.

C.

* D.

Use the figure below to answer question 35.

35. The figure above shows the location of two flags on the city's courthouse grounds. The state flag will be located at the midpoint between the U.S. flag and the city flag. At which point will the state flag be located?

A. $\left(-\dfrac{11}{2}, \dfrac{5}{2}\right)$

B. $(-3, 5)$

* C. $(-1, 2)$

D. $\left(\dfrac{3}{2}, -\dfrac{1}{2}\right)$

36. The length and width of a bedroom floor are each twice as long as the length and width of a bathroom floor. How many times larger is the area of the bedroom floor compared to the area of the bathroom floor?

A.   2

* B.   4

C.   6

D.   8

11

Use the figure below to answer question 37.
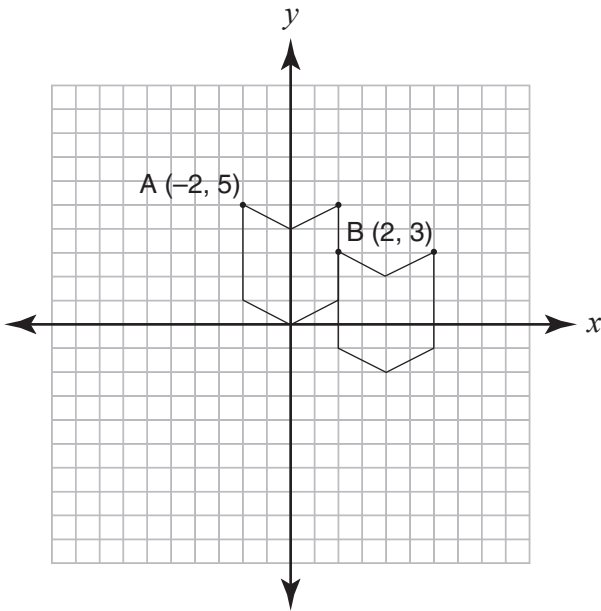
**37.** A quilt design is formed by translating a polygon across the coordinate plane as shown in the figure above. Which is a translational rule that will translate point A to point B?

A. $(x, y) \rightarrow (x + 0, y + 8)$

B. $(x, y) \rightarrow (x - 4, y + 2)$

C. $(x, y) \rightarrow (x + 2, y + 3)$

* D. $(x, y) \rightarrow (x + 4, y - 2)$

38. Which set of statements has a correct conclusion?

A.   Bobby is an athlete. Some athletes play baseball. Therefore, Bobby plays baseball.

B.   Joan planted flowers. Daisies are flowers. Therefore, Joan planted daisies.

* C.   Lee washed some plates. Plates are dishes. Therefore, Lee washed dishes.

D.   Tina drives a car. Some cars can carry three passengers. Therefore, Tina drives a car with three passengers.

Use the figure below to answer question 39.
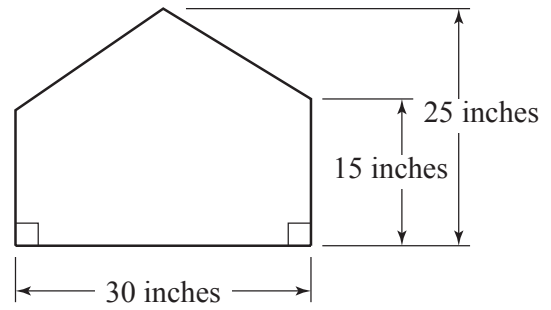
(Not drawn to scale.)

39. What is the area, in square inches, of the shape above?

A.   450

* B.   600

C.   750

D.   825

Use the figure below to answer question 40.
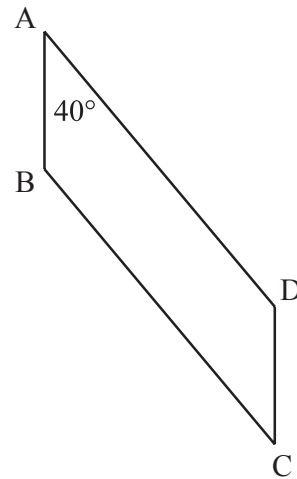
(Not drawn to scale.)

40. A carpenter cuts a board. The board is cut in the shape of a parallelogram as shown above. The carpenter knows the $m \angle A = 40°$. What are the measures of angles C and D?

A. $m \angle C = 40°$; $m \angle D = 130°$

* B. $m \angle C = 40°$; $m \angle D = 140°$

C. $m \angle C = 50°$; $m \angle D = 130°$

D. $m \angle C = 50°$; $m \angle D = 140°$

Use the figure below to answer question 41.

6 ft.
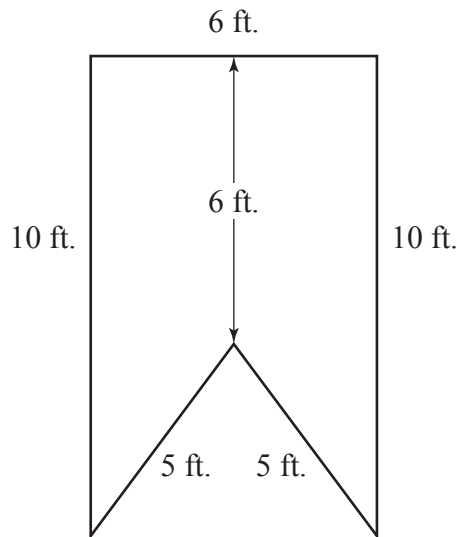
6 ft.

10 ft.   10 ft.

5 ft.   5 ft.

(Not drawn to scale.)

41. Jana is making a large banner as represented by the figure above. Trim will be sewn around the edges. It will not overlap. How much trim will be needed?

A.   24 ft.

* B.   36 ft.

C.   42 ft.

D.   48 ft.

42. Anne made a flowerbed 14 ft. long and 4.5 ft. wide. She covered it with wood chips to a depth of $\frac{1}{4}$ ft. How many cubic ft. of wood chips did Anne use?

* A.   15.75

B.   18.75

C.   63.00

D.   63.25

Use the graph below to answer question 43.
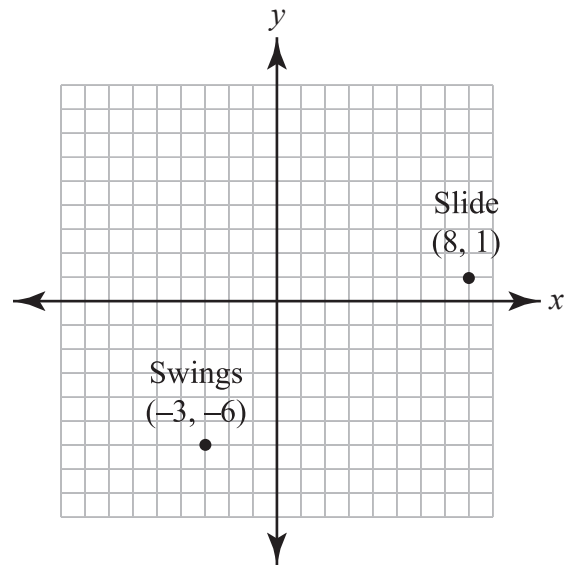
Slide
(8, 1)

Swings
(−3, −6)

43. Tim made a graph of the location of some playground equipment as shown above. What is the distance between the swings and the slide to the nearest tenth of a unit?

A.   7.1

B.   7.6

C.   12.7

* D.   13.0

44. Hannah cut a quadrilateral from a piece of cardboard with the diagonals having the following characteristics.
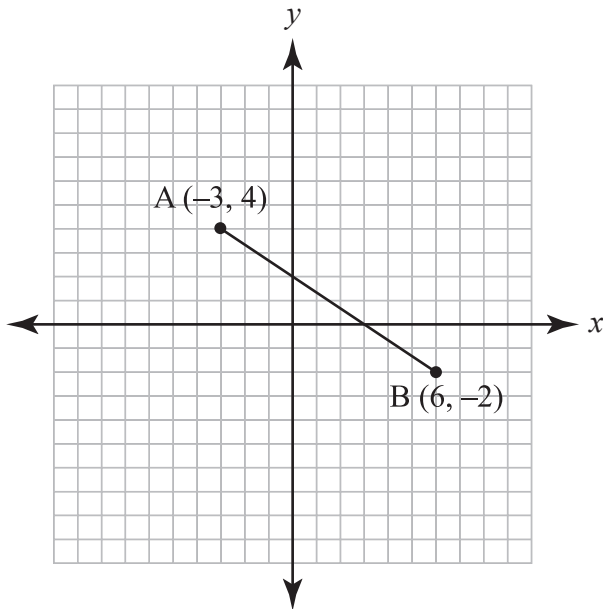
*   congruent
*   perpendicular
*   bisect each other

Which type of quadrilateral must Hannah have cut out?

A.   parallelogram

B.   rectangle

C.   rhombus

* D.   square

13

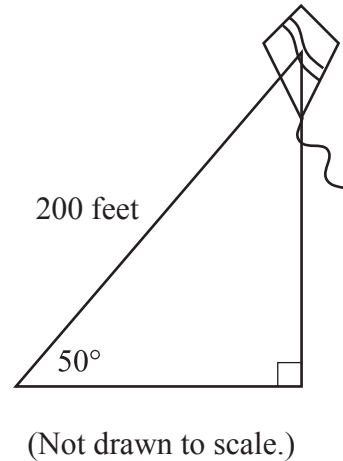**Use the graph below to answer question 45.**

45. What is the midpoint of $\overline{AB}$ shown on the graph above?

A. $(-\dfrac{9}{2},\ 3)$

* B. $(\dfrac{3}{2},\ 1)$

C. $(3,\ 2)$

D. $(\dfrac{9}{2},\ -3)$

46. The window next to Brian's fireplace is a quadrilateral. It has exactly 1 pair of parallel sides. Which describes Brian's window?

A.   parallelogram

B.   rectangle

C.   rhombus

* D.   trapezoid

Use the figure below to answer question 47.

(Not drawn to scale.)

47. Using the figure above, how high is the kite to the nearest foot?
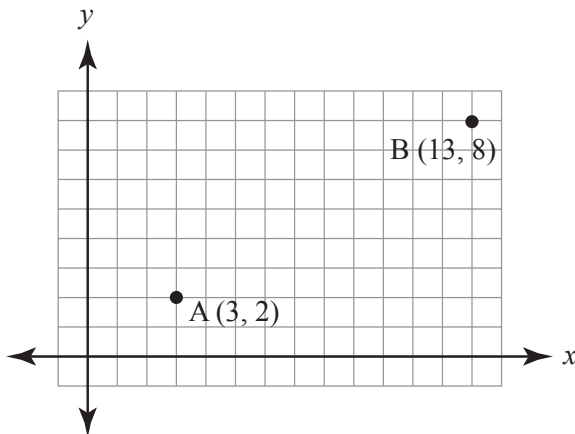
A.   129 feet

* B.   153 feet

C.   238 feet

D.   261 feet

48. Sheila cut a melon in half. The melon was in the shape of a sphere before she cut it. What shape did Sheila see along her cut?

* A.   circle
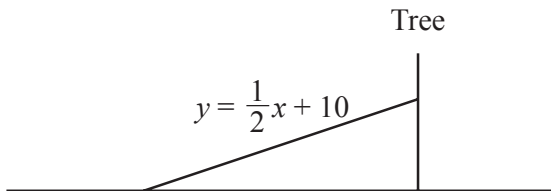
B.   cone

C.   oval

D.   sphere

Use the graph below to answer question 49.

(1 unit represents 1 mile.)

49. Points A and B on the graph above represent the location of two radio towers. Which is the nearest approximation of the distance between the two towers?

A.   8 miles

B.   10 miles

* C.   12 miles

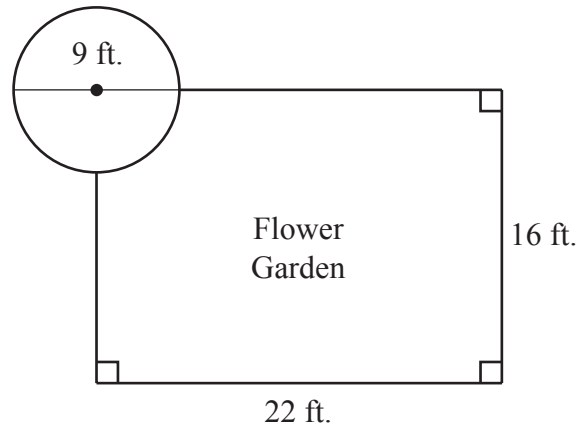D.   16 miles

Use the figure below to answer question 50.

Tree

$y = \dfrac{1}{2}x + 10$

(Not drawn to scale.)

50. The line in the diagram above represents a cable used to support a newly planted tree. A second cable is needed that is **parallel** to the existing cable. Which could be the equation of a second cable?

A. $y = -2x + 5$

B. $y = -\dfrac{1}{2}x + 5$

* C. $y = \dfrac{1}{2}x + 5$

D. $y = 2x + 5$

Use the figure below to answer question 51.

(Not drawn to scale.)

51. Doug is going to plant a flower garden as shown above. Some of the garden is covered by $\dfrac{1}{4}$ of his 9 ft. diameter swimming pool. To the nearest square ft., what is the area of the garden Doug is going to plant? Use $\pi = 3.14$.

* A.   336 square ft.

B.   345 square ft.

C.   352 square ft.

D.   368 square ft.

52. The sophomore class has 145 students. Of these students, 40 play football, 35 play baseball, and 87 play neither football nor baseball. How many sophomores play both football and baseball?

A.   12

* B.   17

C.   18

D.   23

15

PART II   Released Geometry Items

Use the figure below to answer question 53.

Building Supply Store Lot

170 ft.

35°
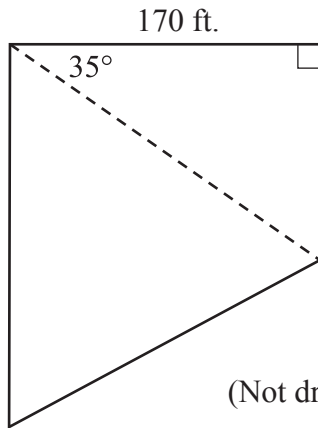
(Not drawn to scale.)

53. The lot of a building supply store is in the shape of a trapezoid as shown above. The broken line represents a fence used to divide the lot into two parts. What is the length to the nearest whole foot of the fence that divides the lot?
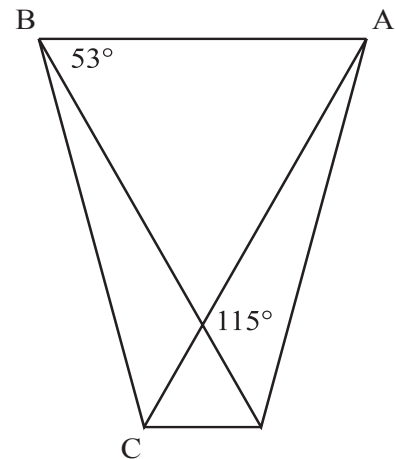
   A   139 ft.

 * B.   208 ft.

   C.   243 ft.

   D.   296 ft.

54. A cylindrical coffee can has a radius of 2.75 inches and a height of 6 inches. What is the volume of the coffee can in cubic inches?

   A. $16.5\,\pi$

   B. $33\,\pi$

 * C. $45.375\,\pi$

   D. $99\,\pi$

Use the figure below to answer question 55.

B   A

53°

115°

C

(Not drawn to scale.)

55. Using the figure above, what is the measurement of $\angle BAC$?

   A.   37°

   B.   53°

 * C.   62°

   D.   65°

56. A bookstore, a clothing store, a music store, and a toy store are in the same section in a mall.

- The clothing store is to the left of the music store.
- The toy store is to the right of the bookstore.
- The bookstore is to the left of the music store.
- The clothing store is to the right of the toy store.

In which order are the stores in the mall from left to right?

   A.   toy store, bookstore, clothing store, music store

   B.   bookstore, toy store, music store, clothing store

 * C.   bookstore, toy store, clothing store, music store

   D.   bookstore, clothing store, toy store, music store

Use the graph below to answer question 57.

(1 unit represents 1 foot.)

57. A designer plotted a map of a client's home. In one room she placed a lighting fixture as shown on the graph above. How long is this fixture to the nearest tenth of a foot?

   A.   5.8 feet

* B.   7.2 feet

   C.   9.1 feet

   D.   10.2 feet

Use the graph below to answer question 58.
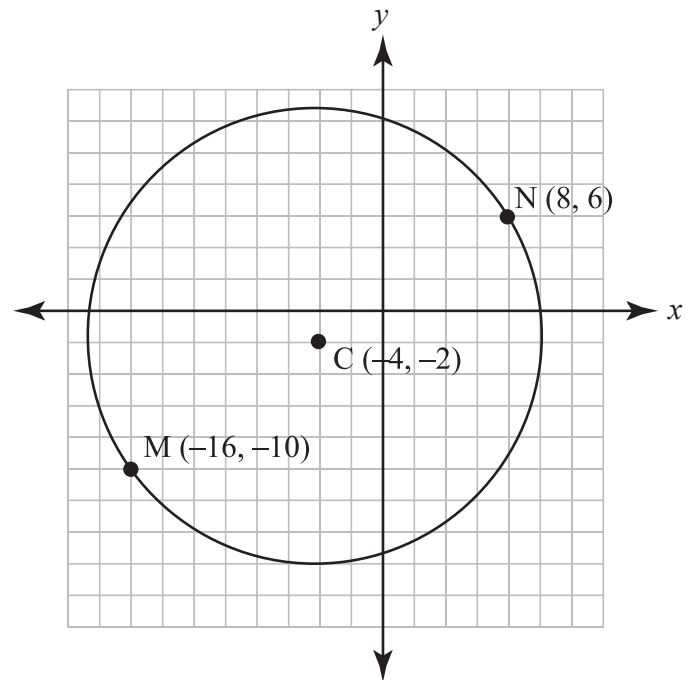
58. Which is the distance between points M and N on the circle shown above to the nearest tenth of a unit?

   A.   14.4

   B.   17.9

   C.   24.5

* D.   28.8

PART II Released Geometry Items

Use the graph below to answer question 59.

Use the figure below to answer question 60.

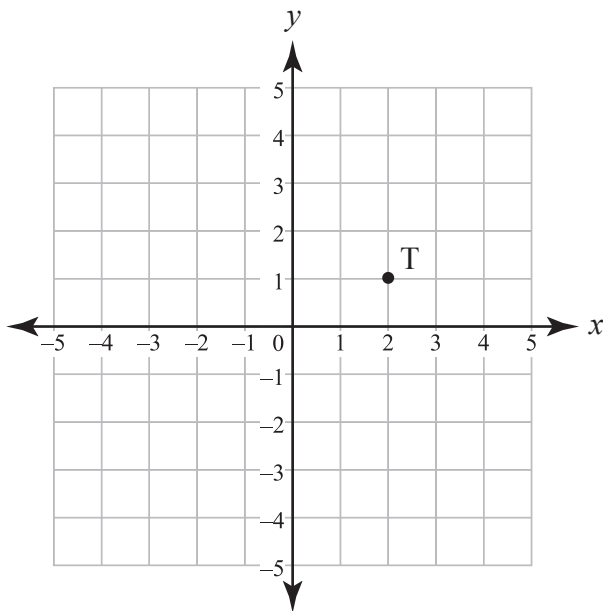**59.** After this translation $(x, y) \rightarrow (x + 3, y - 2)$ of point T, what are the coordinates of the new point?

   A.   (−1, 3)

   B.   (0, 4)

   C.   (3, −2)

 * D.   (5, −1)
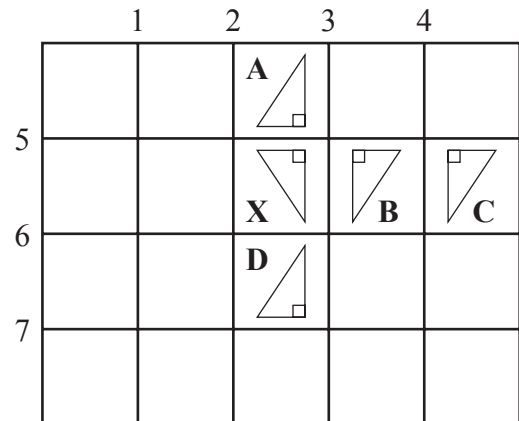
60. Janelle and Franz are playing a game. The rule of the game is each playing piece must go through one transformation. Janelle reflects piece X over line 3. Where will piece X land?

   A.   on piece A

 * B.   on piece B

   C.   on piece C

   D.   on piece D

MATHEMATICS OPEN-RESPONSE ITEM A

A.   Jamal will be asking the city to build a nature area between two parallel streets, Hillview Road and Thompson Avenue. The triangle in the figure below represents the nature area. Jamal needs to include more information in the plan he is presenting.
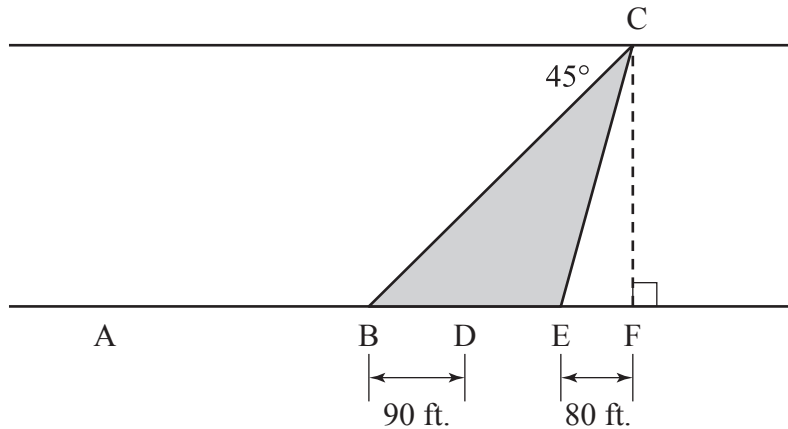

(Not drawn to scale.)

1.   Jamal will need to know the measure of $\angle$ ABC. What is the measure of $\angle$ ABC? Show or explain all of your work even if you use mental math or a calculator.

A gate will be placed 90 ft. from point B at point D. D is the midpoint of $\overline{BE}$. Jamal also knows the distance from point E to point F is 80 ft. as shown in the figure above.
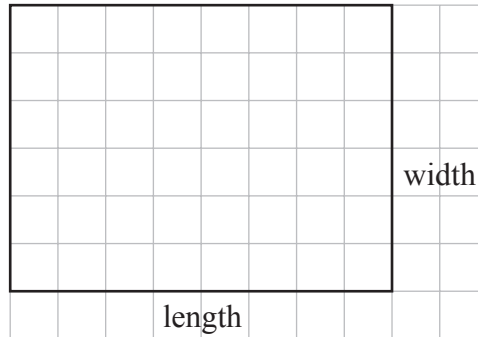
2.   For his plans Jamal will need to determine the length of $\overline{BC}$. Determine the length of $\overline{BC}$. Show or explain all of your work even if you use mental math or a calculator.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

MATHEMATICS OPEN-RESPONSE ITEM B

B.   The drawing below shows a scale floor plan of Tom's house.

width

length

(1 unit represents 5 ft.)

1.   What is the actual area of Tom's house? Show or explain all of your work even if you use mental math or a calculator. Label your answer with correct units.

2.   Tom adds a garage to the side of the house. The garage's width is $\frac{3}{4}$ the width of the house. The garage floor has an area of 630 square feet. What are the length and width of the garage? Show or explain all of your work even if you use mental math or a calculator.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

## RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM B

SCORE	DESCRIPTION
4	The student earns 6 points. Response contains correct units of Sq. Ft. in Part 1. Response contains correct units of Ft. in Part 2. Response contains no incorrect work.
3	The student earns 5 points.
2	The student earns 3 – 4 points or the student earns 2 points if 1 point is from Part 1 and 1 point is from Part 2.

1	The student earns 1 or 2 points if both points are from the same part or some minimal understanding shown.
	        Ex: 5 x 6 = 30 and 5 x 8 = 40 only
	        Ex: A = 6 x 8 = 48 only
	        Ex: 6 x 8 x 5 = 240 only

0	The student earns 0 points. No understanding is shown.
B	Blank – No Response. A score of "B" will be reported as "NA" (No Attempt – Zero Score).

Note: Correct labels are an issue only at the "4" level.

MATHEMATICS OPEN-RESPONSE ITEM C

C. Samantha built a shed. A drawing of the shed she built is shown below.
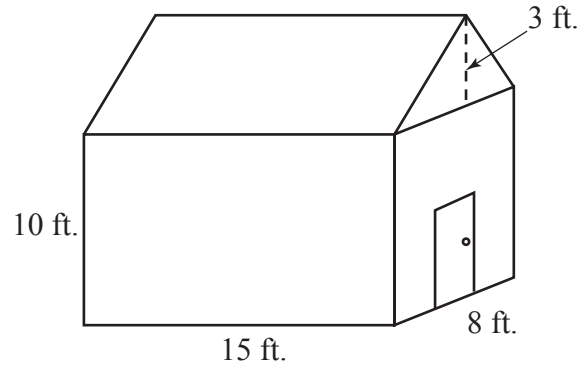
(Not drawn to scale.)

1. What is the surface area of the outside of the shed, including the roof and door (do not include the bottom of the shed)? Show or explain all of your work even if you use mental math or a calculator.

2. What is the storage capacity (volume) of the shed? Show or explain all of your work even if you use mental math or a calculator.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM C

SCORE	DESCRIPTION
4	The student earns 6 points. Response contains labels of "sq. ft." in Part 1 and "cu. ft." in Part 2. Response contains no incorrect work.
3	The student earns 4 – 5 points.
2	The student earns 2 ½ – 3 ½ points or the student earns 2 points if 1 point is from Part 1 and 1 point is from Part 2.
1	The student earns ½ – 2 points (if both points are from the same part) or some minimal understanding shown. Ex: Part 1 finds areas of 3 different surfaces or 2 correct pairs or Part 2: V = 1200 no work.
0	The student earns 0 points. No understanding is shown.
B	Blank – No Response. A score of "B" will be reported as "NA" (No Attempt – Zero Score).

MATHEMATICS OPEN-RESPONSE ITEM D

D.

Gases at Normal Temperature

Gases Found in
Sea Water

Gases Found in
Dry Air
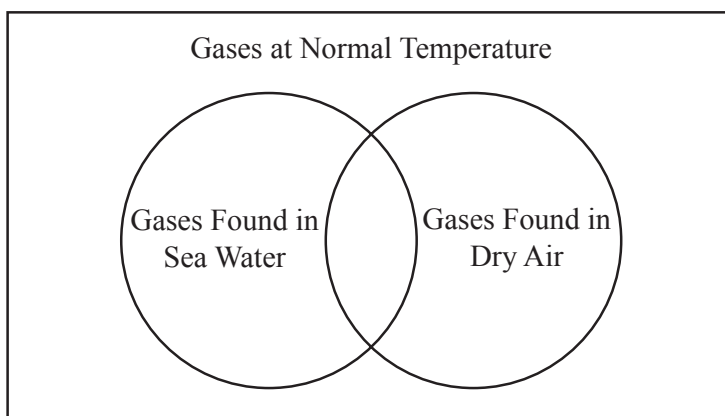
Gases at Normal Temperature (Atomic Symbol)		Gases Found in Sea Water (Atomic Symbol)	Gases Found in Dry Air (Atomic Symbol)	
Hydrogen (H)	Chlorine (Cl)	Chlorine (Cl)	Hydrogen (H)	Krypton (Kr)
Neon (Ne)	Krypton (Kr)	Hydrogen (H)	Neon (Ne)	Nitrogen (N)
Oxygen (O)	Nitrogen (N)	Nitrogen (N)	Oxygen (O)	Xenon (Xe)
Xenon (Xe)	Radon (Rn)	Oxygen (O)		

The lists above give information about different gases.

1.   Copy the Venn diagram above into your Student Answer Document. Write the atomic symbol of each gas in the correct location in the Venn diagram.

2.   Explain how you know where to place the atomic symbols.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM D

SCORE	DESCRIPTION
4	The student earns 5 points. Response includes correct labeling of Rectangle and Circles. Response contains no incorrect work.
3	The student earns 4 points.
2	The student earns 2 – 3 points.
1	The student earns 1 point.
0	The student earns 0 points. No understanding is shown.
B	Blank – No Response. A score of "B" will be reported as "NA" (No Attempt – Zero Score).

MATHEMATICS OPEN-RESPONSE ITEM E

E.   The broken line on the graph below represents the railroad line that passes through Bovy, Greenville, and Pierce. Pierce is located at the point (3, 10) and Greenville is located at point (–7, 2). The distance from Greenville to Pierce is equal to the distance from Greenville to Bovy.
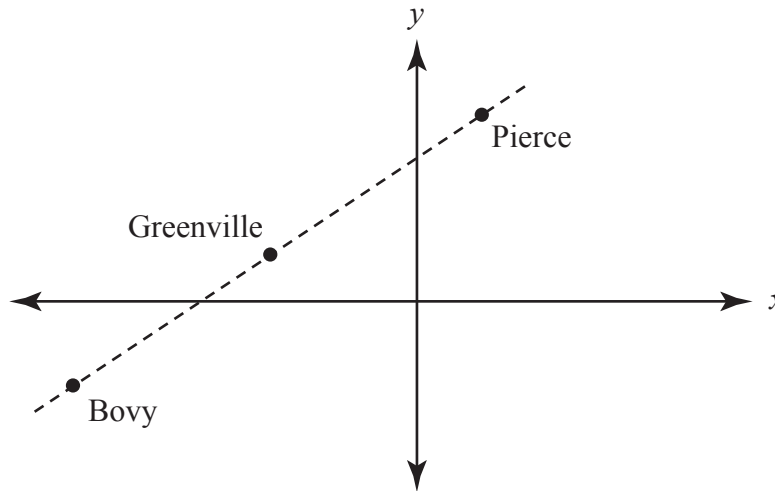
(Not drawn to scale.)

1.   Determine the coordinates of the point that represents the city of Bovy. Show or explain all of your work even if you use mental math or a calculator.

The railroad plans to build another line that passes through Greenville. The new line will be straight and will be **perpendicular** to the original tracks. The designers will use a linear equation to describe the location of the new line.

2.   Write an equation that represents the new railroad line that will pass through Greenville. Show or explain all of your work even if you use mental math or a calculator.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.