1. A local pizza restaurant sends pizzas to the high school twelve to a carton. If the pizzas are one inch thick, what is the volume of the cylindrical shipping carton for the twelve pizzas with a diameter of 18 inches each?

   A. 452.39 cubic inches
   B. 678.58 cubic inches
   C. 2035.75 cubic inches
   D. 3053.63 cubic inches

2. A football field is 360 feet long by 160 feet wide. What is the surface area of the football field?

   A. 520 square feet
   B. 1,680 square feet
   C. 57,600 square feet
   D. 155,200 square feet

3. In December 1990, the largest pizza ever baked was made in South Africa. The diameter of the pizza was 37.4 meters. What was the area of the pizza to the nearest square meter?

   A. 117 square meters
   B. 235 square meters
   C. 1099 square meters
   D. 4394 square meters

4. The largest pizza ever made in the United States was in 1987 in Florida. The pizza measured approximately 140 feet across. What was the circumference of the pizza to the nearest foot?

   A. 440 feet
   B. 880 feet
   C. 15,394 feet
   D. 61,575 feet
5. Calculate the area of the outer ring of the dartboard.

A. 15.7 square inches  
B. 28.2 square inches  
C. 62.8 square inches  
D. 113.1 square inches

6. What is the diameter of a circle when the circumference is 75.4 inches?

A. 12.0 inches  
B. 24.0 inches  
C. 27.3 inches  
D. 37.7 inches

7. Find the volume of the oatmeal container to the nearest cubic inch if the height is 8 inches and the diameter of the circular top is 5 inches.

A. 126 cubic inches  
B. 157 cubic inches  
C. 200 cubic inches  
D. 628 cubic inches

8. The large cube consists of 27 small cubes. You paint all the outside faces on the large cube, except the base of the large cube. How many faces of the 27 small cubes will be painted?

A. 25 faces  
B. 27 faces  
C. 45 faces  
D. 54 faces
2-Point Item1

One vertex of a 16-inch by 8-inch rectangle is on a circle’s center. The radius of the circle is 7 inches.

- Calculate the shaded area of the rectangle that the circle does not overlap.
- Round the area to the nearest hundredth of a square inch.

Show your work using words, numbers, and/or diagrams.

The area of the shaded region of the rectangle is __________ square inches.
2-Point Item 2

Both the 4-inch cube and the box have the same volume.

- What is the volume of each?
- Calculate the dimensions of the rectangular box if its height is 8 inches and the measures of the depth and width are whole numbers.

Show all the steps to support your work using words, numbers, and/or diagrams.

| The volume of the cube and box are each ______ cubic inches. |
| The dimensions of the rectangular box are 8 by ____ by ____ inches. |
2-Point Item 3

A local pizza restaurant makes a large round pizza with a diameter of 18 inches. The chef wants to make a square pizza with about the same amount of pizza.

- Calculate the area of a pizza with a diameter of 18 inches.
- Determine the dimensions of a square pizza with approximately the same area.

Show your work using words, numbers, and/or diagrams.

The area of the 18-inch pizza is ______ square inches.
The dimensions of the square pizza are _____ by _____ inches.
4-Point Item

A running track will be installed at a local high school. Each end of the track is a semicircle. The inside perimeter of the track is 1320 feet (1/4 of a mile), and the length of each straight stretch is 360 feet.

The school wants to put sod in the infield. What is the surface area of the infield to the nearest square foot?

What is the surface area of the infield to the nearest square foot?

Show your work using words, numbers, and/or diagrams.

Area of the infield of the track: ______________ square feet.
9. A local pizza restaurant sends pizzas to the high school twelve to a carton. If the pizzas are one inch thick, what is the volume of the cylindrical shipping carton for the twelve pizzas whose diameter are 18 inches each?

A. 452.39 cubic inches \( \pi (12)(12) \)
B. 678.58 cubic inches \( \pi (18)(12) \)
C. 2035.75 cubic inches \( \pi (6^2)(18) \)
D. 3053.63 cubic inches \( \pi (9^2)(12) \)

10. A football field is 360 feet long by 160 feet wide. What is the surface area of the football field?

A. 520 square feet \( (360 + 160) \)
B. 1,680 square feet \( 2(360) + 2(160) \)
C. **57,600 square feet** \( (360 \times 160) \)
D. 155,200 square feet \( (360^2 + 160^2) \)

11. In December 1990, the largest pizza ever baked was made in South Africa. The diameter of the pizza was 37.4 meters. What was the area of the pizza to the nearest square meter?

A. 117 square meters \( 2(18.7)\pi \)
B. 235 square meters \( 2(37.4)\pi \)
C. **1099 square meters** \( *18.7^2\pi \)
D. 4394 square meters \( 37.4^2\pi \)

12. The largest pizza ever made in the United States was in 1987 in Florida. The pizza measured approximately 140 feet across. What was the circumference of the pizza to the nearest foot?

A. **440 feet** \( *140\pi \)
B. 880 feet \( 2(140) \pi \)
C. 15,394 feet \( 70^2\pi \)
D. 61,575 feet \( 140^2\pi \)
13. Calculate the area of the outer ring of the dartboard.

A. 15.7 square inches \(3^2\pi - 2^2\pi\)
B. 28.2 square inches \(3^2\pi\)
C. **62.8 square inches** \(*6^2\pi - 4^2\pi\)
D. 113.1 square inches \(6^2\pi\)

14. What is the diameter of a circle when the circumference is 75.4 inches?

A. 12.0 inches \(37.7/\pi\)
B. **24.0 inches** \(*75.4/\pi\)
C. 27.3 inches \(\sqrt{75.4(\pi)}\)
D. 37.7 inches \(75.4/2\)

15. Find the volume of the oatmeal container to the nearest cubic inch if the height is 8 inches and the diameter of the circular top is 5 inches.

A. 126 cubic inches \(\pi(5)(8)\)
B. **157 cubic inches** \(*\pi(2.5^2)(8)\)
C. 200 cubic inches \((5)(5)(8)\)
D. 628 cubic inches \(\pi(5^2)(8)\)

16. The large cube consists of 27 small cubes. You paint all the outside faces on the large cube, except the base of the large cube. How many faces of the 27 small cubes will be painted?

A. 25 faces only counted one face of an edge cube
B. 27 faces only counted sides showing in diagram
C. **45 faces** *
D. 54 faces all sides + base
2-Point Item 1

One vertex of a 16-inch by 8-inch rectangle is on a circle’s center. The radius of the circle is 7 inches.

- Calculate the shaded area of the rectangle that the circle does not overlap.

- Round the area to the nearest hundredth of a square inch.

Show your work using words, numbers, and/or diagrams.

The area of the shaded region of the rectangle is __________ square inches.
2-Point Item 1
Scoring Rubric

Strand: Measurement

MEO3 Learning Target: (Procedures) Use formulas, including the Pythagorean Theorem, to determine missing measurements of triangles, prisms, or cylinders. (GLE 1.2.5)

Item Characteristics:
Items may ask student to determine perimeter, circumference, and/or area of a circle or triangle.

2-point response: The student shows an understanding of how to find the area of circles and rectangles and uses that data to find the area of a partial region by doing five or six of the following:
- Indicates 128 square inches as the area of the whole rectangle.
- Shows work and/or explanation supporting the area of the rectangle.
- Indicates 38.48 square inches as the area of the circle that overlaps the rectangle.
- Shows work and/or explanation supporting the area of the circle.
- Indicates 89.52 square inches as the area of the shaded region of the rectangle.
- Shows work and/or explanation supporting the area of the shaded region.

Note: Allow decimal rounding error as long as the error is no more than .02.

1-point response: The student shows partial understanding of how to find the area of circles and rectangles and use that data to find the area of a partial region by doing three or four of the following:
- Indicates 128 square inches as the area of the whole rectangle.
- Shows work and/or explanation supporting the area of the rectangle.
- Indicates 38.48 square inches as the area of the circle that overlaps the rectangle.
- Shows work and/or explanation supporting the area of the circle.
- Indicates 89.52 square inches as the area of the shaded region of the rectangle.
- Shows work and/or explanation supporting the area of the shaded region.

Note: Allow decimal rounding error as long as the error is no more than .02.

0-point response: The student shows very little or no understanding of how to find the area of circles and rectangles and use that data to find the area of a partial region.
2-Point Item 2

Both the 4-inch cube and the box have the same volume.

- What is the volume of each?
- Calculate the dimensions of the rectangular box if its height is 8 inches and the measures of the depth and width are whole numbers.

Show all the steps to support your work using words, numbers, and/or diagrams.

The volume of the cube and box are each ______ cubic inches.

The dimensions of the rectangular box are 8 by ____ by ____ inches.
2-Point Item 2
Scoring Rubric

Strand: Measurement

MEO1 Learning Target: (Attributes and Dimensions) Demonstrate understanding of how change in one linear dimension affects volume and surface area of rectangular prisms. (GLE 1.2.1)

Item Characteristics:
Items may ask students to use areas and/or volumes to compare rectangles, circles, triangles, prisms, and/or cylinders.

2-point response: The student shows an understanding of how to find the volume of a rectangular prism and the dimensions of a second rectangular prism with the same volume given length by doing the following:

- Indicates that the volume of both rectangular prisms is 64 inches cubed.
- Shows work and/or explanation supporting the volume of the cube.
- Indicates that the dimensions of the rectangular prism will be 8 by 2 by 4 inches (or 8"X1"X8").
- Shows work and/or explanation to support the dimensions of the rectangular prism.

1-point response: The student shows partial understanding of how to find the volume of a rectangular prism and the dimensions of a second rectangular prism with the same volume given length by doing two or three of the following:

- Indicates that the volume of both rectangular prisms is 64 inches cubed.
- Shows work and/or explanation supporting the volume of the cube.
- Indicates that the dimensions of the rectangular prism will be 8 by 2 by 4 inches (or 8"X1"X8").
- Shows work and/or explanation to support the dimensions of the rectangular prism.

0-point response: The student shows very little or no understanding of how to find the volume of a rectangular prism and the dimensions of a second rectangular prism with the same volume given length.
2-Point Item 3

A local pizza restaurant makes a large round pizza with a diameter of 18 inches. The chef wants to make a square pizza with about the same amount of pizza.

- Calculate the area of a pizza with a diameter of 18 inches.
- Determine the dimensions of a square pizza with approximately the same area.

Show your work using words, numbers, and/or diagrams.

The area of the 18-inch pizza is _________ square inches.

The dimensions of the square pizza are _____ by _____ inches.
**2-Point Item 3**

Scoring Rubric

Strand: Measurement

MEO3 Learning Target: (Procedures) Use formulas to determine missing measurements of circles and rectangles. (GLE 1.2.5)

Item Characteristics:
- Items may ask students to determine perimeter and area of a circle and rectangle.

**2-point response:** The student shows an understanding of how to find the area of a circle and length of a side of a square given an approximate area by doing the following:
  - Indicates the area of the 18-inch pizza to be about 254.5 square inches.
  - Shows work and/or explanation supporting the area of the 18-inch pizza.
  - Indicates that the dimensions of the square pizza will be 16 by 16 inches.
  - Shows work and/or explanation to support the dimensions of the square pizza.

*May include the area of the 16 by 16 inch pizza to be 256 square inches.*

**1-point response:** The student shows partial understanding of how to find the area of a circle and length of a side of a square given an approximate area by doing two or three of the following:
  - Indicates the area of the 18-inch pizza to be about 254.5 square inches.
  - Shows work and/or explanation supporting the area of the 18-inch pizza.
  - Indicates that the dimensions of the square pizza will be 16 by 16 inches.
  - Shows work and/or explanation to support the dimensions of the square pizza.

*May include the area of the 16 by 16 inch pizza to be 256 square inches.*

**0-point response:** The student shows very little or no understanding of how to find the area of a circle and length of a side of a square given an approximate area.
4-Point Item

A running track will be installed at a local high school. Each end of the track is a semicircle. The inside perimeter of the track is 1320 feet (1/4 of a mile), and the length of each straight stretch is 360 feet. The school wants to put sod in the infield.

360 feet

What is the surface area of the infield to the nearest square foot?

Show your work using words, numbers, and/or diagrams.

Area of the infield of the track is ________________ square feet.
Strand: Measurement

MEO3 Learning Target: (Procedures) Use formulas to determine missing measurements of circles, triangles, rectangular prisms, and cylinders. (GLE 1.2.5)

Item Characteristics:
- Items may ask students to determine circumference, perimeter, and/or area of a circle, rectangle, and/or triangle.

4-point response: The student shows an understanding of how to find the surface area of an oval by doing the following:
- Indicates that the surface area of the circular ends is \( \approx 28,648 \) square feet.
- Shows work and/or explanation supporting the surface area of the circular ends.
- Indicates that the surface area of the rectangular portion of the infield is \( \approx 68,755 \) square feet.
- Shows work and/or explanation to support the rectangular surface area.
- Indicates that the surface area for the entire infield is \( \approx 97,403 \) square feet.
- Shows work and/or explanation to support the entire infield surface area.

3-point response: The student shows partial understanding of how to find the surface area of an oval by doing four or five of the steps listed above.

2-point response: The student shows partial understanding of how to find the surface area of an oval by doing two or three of the steps listed above.

1-point response: The student shows partial understanding of how to find the surface area of an oval by doing one of the steps listed above.

0-point response: The student shows very little or no understanding of how to find the surface area of an oval.