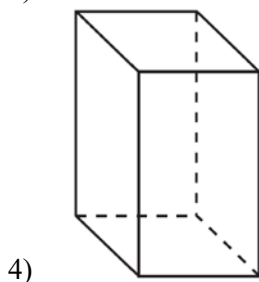
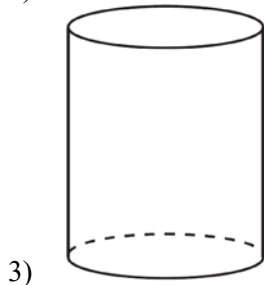
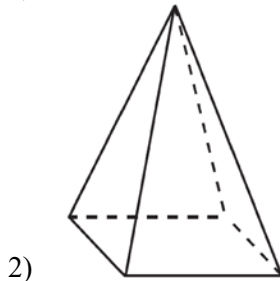
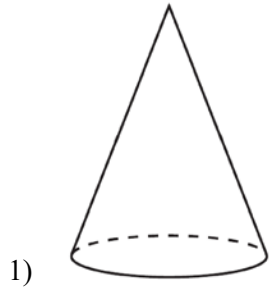


**G.GMD.B.4: Rotations of Two-Dimensional Objects**

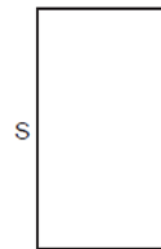
- 1 A student has a rectangular postcard that he folds in half lengthwise. Next, he rotates it continuously about the folded edge. Which three-dimensional object below is generated by this rotation?



- 2 If the rectangle below is continuously rotated about side  $w$ , which solid figure is formed?

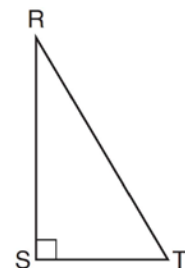


- 1) pyramid  
 2) rectangular prism  
 3) cone  
 4) cylinder
- 3 The rectangle drawn below is continuously rotated about side  $S$ .



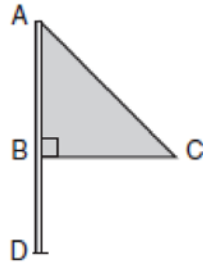
Which three-dimensional figure is formed by this rotation?

- 1) rectangular prism  
 2) square pyramid  
 3) cylinder  
 4) cone
- 4 Which object is formed when right triangle  $RST$  shown below is rotated around leg  $\overline{RS}$ ?



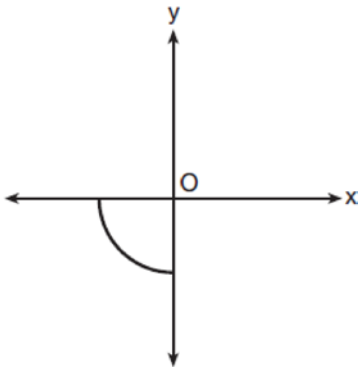
- 1) a pyramid with a square base  
 2) an isosceles triangle  
 3) a right triangle  
 4) a cone

- 5 Triangle  $ABC$  represents a metal flag on pole  $AD$ , as shown in the accompanying diagram. On a windy day the triangle spins around the pole so fast that it looks like a three-dimensional shape.



Which shape would the spinning flag create?

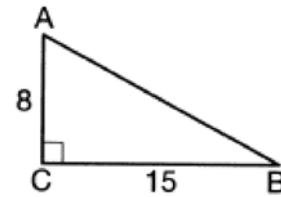
- 1) sphere
  - 2) pyramid
  - 3) right circular cylinder
  - 4) cone
- 6 Circle  $O$  is centered at the origin. In the diagram below, a quarter of circle  $O$  is graphed.



Which three-dimensional figure is generated when the quarter circle is continuously rotated about the  $y$ -axis?

- 1) cone
  - 2) sphere
  - 3) cylinder
  - 4) hemisphere
- 7 If a rectangle is continuously rotated around one of its sides, what is the three-dimensional figure formed?
- 1) rectangular prism
  - 2) cylinder
  - 3) sphere
  - 4) cone

- 8 If an equilateral triangle is continuously rotated around one of its medians, which 3-dimensional object is generated?
- 1) cone
  - 2) pyramid
  - 3) prism
  - 4) sphere
- 9 A circle is continuously rotated about its diameter. Which three-dimensional object will be formed?
- 1) cone
  - 2) prism
  - 3) sphere
  - 4) cylinder
- 10 As shown in the diagram below, right triangle  $ABC$  has side lengths of 8 and 15.



If the triangle is continuously rotated about  $\overline{AC}$ , the resulting figure will be

- 1) a right cone with a radius of 15 and a height of 8
  - 2) a right cone with a radius of 8 and a height of 15
  - 3) a right cylinder with a radius of 15 and a height of 8
  - 4) a right cylinder with a radius of 8 and a height of 15
- 11 An isosceles right triangle whose legs measure 6 is continuously rotated about one of its legs to form a three-dimensional object. The three-dimensional object is a
- 1) cylinder with a diameter of 6
  - 2) cylinder with a diameter of 12
  - 3) cone with a diameter of 6
  - 4) cone with a diameter of 12

12 Square *MATH* has a side length of 7 inches. Which three-dimensional object will be formed by continuously rotating square *MATH* around side *AT*?

- 1) a right cone with a base diameter of 7 inches
- 2) a right cylinder with a diameter of 7 inches
- 3) a right cone with a base radius of 7 inches
- 4) a right cylinder with a radius of 7 inches

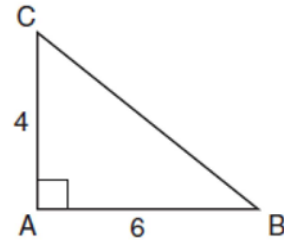
13 A rectangle with dimensions of 4 feet by 7 feet is continuously rotated about one of its 4-foot sides. The resulting three-dimensional object is a

- 1) cylinder with a height of 7 feet and a base radius of 4 feet.
- 2) cylinder with a height of 4 feet and a base radius of 7 feet.
- 3) cone with a height of 7 feet and a base radius of 7 feet.
- 4) cone with a height of 4 feet and a base radius of 7 feet.

14 Which three-dimensional figure will result when a rectangle 6 inches long and 5 inches wide is continuously rotated about the longer side?

- 1) a rectangular prism with a length of 6 inches, width of 6 inches, and height of 5 inches
- 2) a rectangular prism with a length of 6 inches, width of 5 inches, and height of 5 inches
- 3) a cylinder with a radius of 5 inches and a height of 6 inches
- 4) a cylinder with a radius of 6 inches and a height of 5 inches

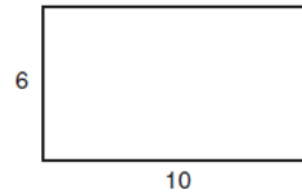
15 In the diagram below, right triangle *ABC* has legs whose lengths are 4 and 6.



What is the volume of the three-dimensional object formed by continuously rotating the right triangle around *AB*?

- 1)  $32\pi$
- 2)  $48\pi$
- 3)  $96\pi$
- 4)  $144\pi$

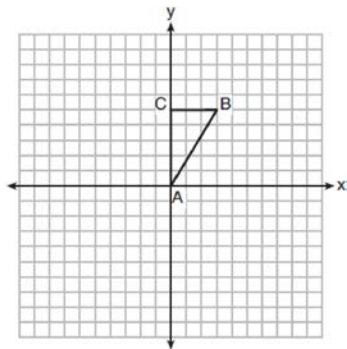
16 A rectangle whose length and width are 10 and 6, respectively, is shown below. The rectangle is continuously rotated around a straight line to form an object whose volume is  $150\pi$ .



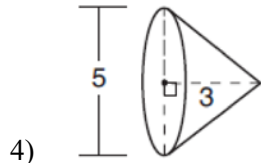
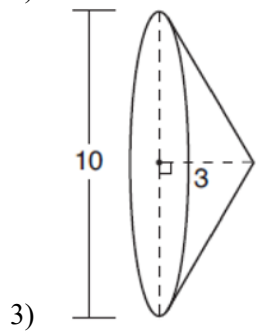
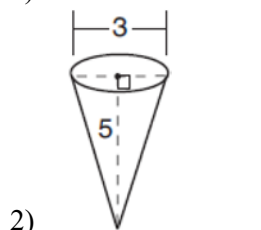
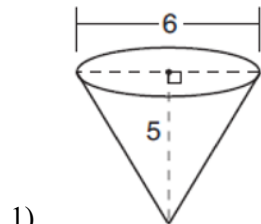
Which line could the rectangle be rotated around?

- 1) a long side
- 2) a short side
- 3) the vertical line of symmetry
- 4) the horizontal line of symmetry

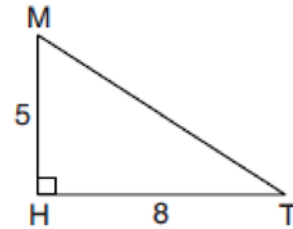
- 17 Triangle  $ABC$ , with vertices at  $A(0,0)$ ,  $B(3,5)$ , and  $C(0,5)$ , is graphed on the set of axes shown below.



Which figure is formed when  $\triangle ABC$  is rotated continuously about  $\overline{BC}$ ?



- 18 In right triangle  $MTH$  shown below,  $m\angle H = 90^\circ$ ,  $HT = 8$ , and  $HM = 5$ .



Determine and state, to the nearest tenth, the volume of the three-dimensional solid formed by rotating  $\triangle MTH$  continuously around  $\overline{MH}$ .

- 19 In isosceles triangle  $ABC$  shown below,  $\overline{AB} \cong \overline{AC}$ , and altitude  $\overline{AD}$  is drawn.



The length of  $\overline{AD}$  is 12 cm and the length of  $\overline{BC}$  is 10 cm. Determine and state, to the nearest cubic centimeter, the volume of the solid formed by continuously rotating  $\triangle ABC$  about  $\overline{AD}$ .

## G.GMD.B.4: Rotations of Two-Dimensional Objects

### Answer Section

- 1 ANS: 3 REF: 061601geo  
 2 ANS: 4 REF: 081503geo  
 3 ANS: 3 REF: 082307geo  
 4 ANS: 4 REF: 061501geo  
 5 ANS: 4 REF: 010417a  
 6 ANS: 4 REF: 011810geo  
 7 ANS: 2 REF: 061903geo  
 8 ANS: 1 REF: 081603geo  
 9 ANS: 3 REF: 012302geo  
 10 ANS: 1 REF: 062208geo  
 11 ANS: 4 REF: 081803geo  
 12 ANS: 4 REF: 081911geo  
 13 ANS: 2 REF: 062415geo  
 14 ANS: 3 REF: 011911geo  
 15 ANS: 1

$$V = \frac{1}{3} \pi (4)^2 (6) = 32\pi$$

REF: 061718geo

- 16 ANS: 3

$$v = \pi r^2 h \quad (1) \quad 6^2 \cdot 10 = 360$$

$$150\pi = \pi r^2 h \quad (2) \quad 10^2 \cdot 6 = 600$$

$$150 = r^2 h \quad (3) \quad 5^2 \cdot 6 = 150$$

$$(4) \quad 3^2 \cdot 10 = 900$$

REF: 081713geo

- 17 ANS: 3 REF: 061816geo

- 18 ANS:

$$\frac{1}{3} \pi \times 8^2 \times 5 \approx 335.1$$

REF: 082226geo

- 19 ANS:

$$\frac{1}{3} \pi \times 5^2 \times 12 = 100\pi \approx 314$$

REF: 012425geo