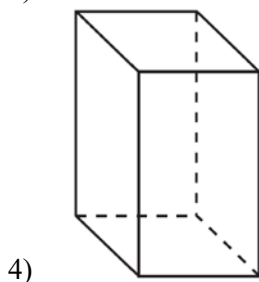Name: _____

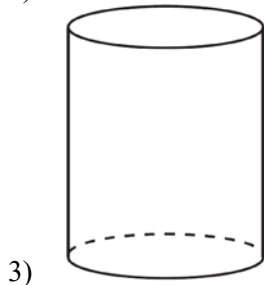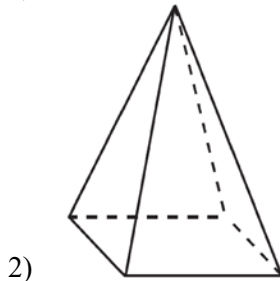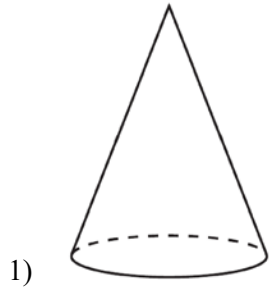## G.GMD.B.4: Rotations of Two-Dimensional Objects

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?

1)

2)

3)

4)



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*.
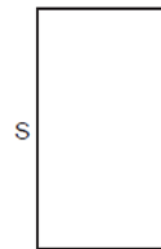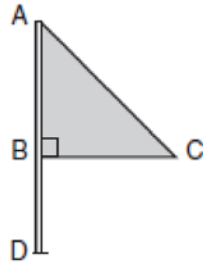


Which three-dimensional figure is formed by this rotation?
1) rectangular prism
2) square pyramid
3) cylinder
4) cone

4 Which object is formed when right triangle *RST* shown below is rotated around leg $\overline{RS}$?
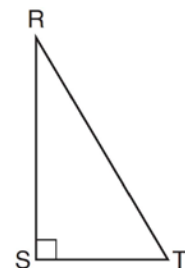


1) a pyramid with a square base
2) an isosceles triangle
3) a right triangle
4) a cone

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.
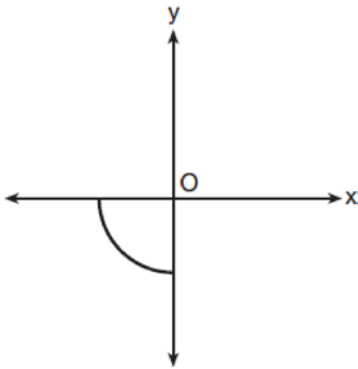


Which three-dimensional figure is generated when the quarter circle is continuously rotated about the *y*-axis?
1)   cone
2)   sphere
3)   cylinder
4)   hemisphere

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.
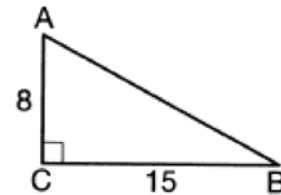


If the triangle is continuously rotated about $\overline{AC}$, the resulting figure will be
1)   a right cone with a radius of 15 and a height of 8
2)   a right cone with a radius of 8 and a height of 15
3)   a right cylinder with a radius of 15 and a height of 8
4)   a right cylinder with a radius of 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 $\overline{AT}$?
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  A square with a side length of 3 is continuously rotated about one of its sides. The resulting three-dimensional object is a
1)  cube with a volume of 9.
2)  cube with a volume of 27.
3)  cylinder with a volume of $27\pi$.
4)  cylinder with a volume of $54\pi$.

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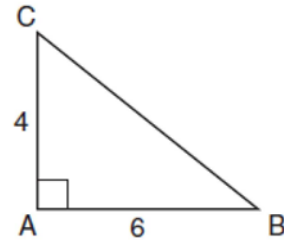


What is the volume of the three-dimensional object formed by continuously rotating the right triangle around $\overline{AB}$?
1)  $32\pi$
2)  $48\pi$
3)  $96\pi$
4)  $144\pi$

17  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 $150\pi$.
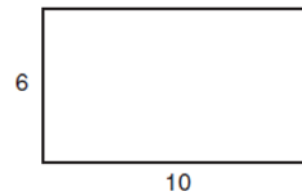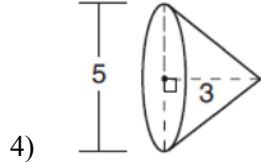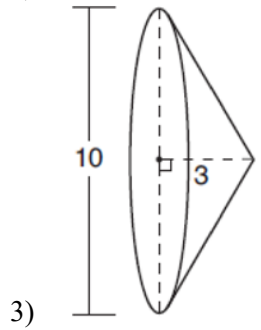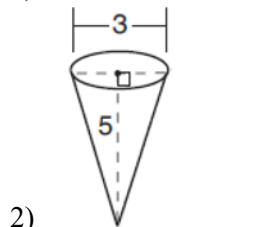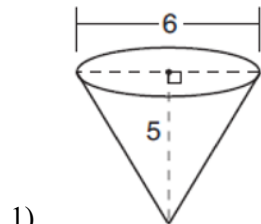


Which line could the rectangle be rotated around?
1)  a long side
2)  a short side
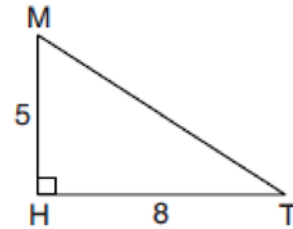3)  the vertical line of symmetry
4)  the horizontal line of symmetry

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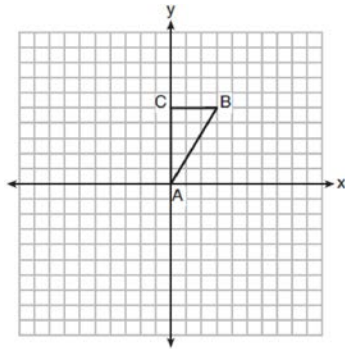


Which figure is formed when △*ABC* is rotated continuously about $\overline{BC}$?

1)



2)



3)



4)



19 In right triangle *MTH* shown below, m∠*H* = 90°, *HT* = 8, and *HM* = 5.



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

20 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 △*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: 3

$$V = \pi(3)^2(3) = 27\pi$$

REF: 012507geo
16  ANS: 1

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

REF: 061718geo
17  ANS: 3

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

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

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

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

REF: 081713geo
18  ANS: 3              REF: 061816geo
19  ANS:

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

REF: 082226geo
20  ANS:

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

REF: 012425geo

1