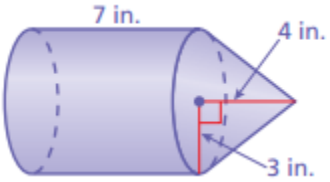
Unit 6 – Volume and Cross Sections Review

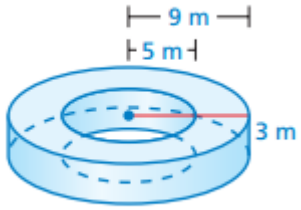
Name: _____ Block: _____

Find the volume of the below composite figures.

1.



2.



3. Marge has a cylindrical tin of popcorn that is 18 in. tall and has a radius of 4 in. She wants to use the tin for something else and needs to empty the popcorn into a box. The box is 8 in. long, 8 in. wide and 14 in. tall. Will the popcorn fit in the box? Explain.

4. Where does pi come from?

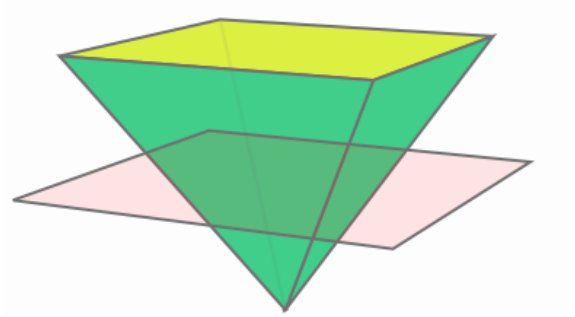
5. Explain where the area of a circle came from.

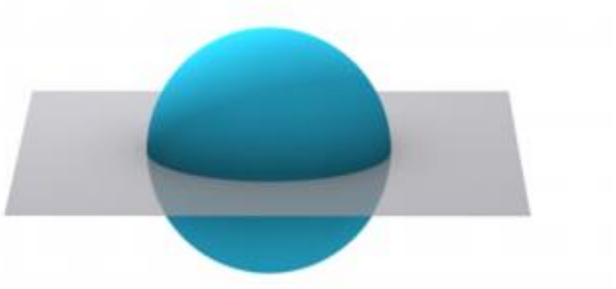
6. Describe in detail the solid formed by rotating a 2 x 2 rectangle with vertices (3, 0), (5, 0), (3, 2) and (5, 2) about the *x*-axis. Include the dimensions of the solid in your description.

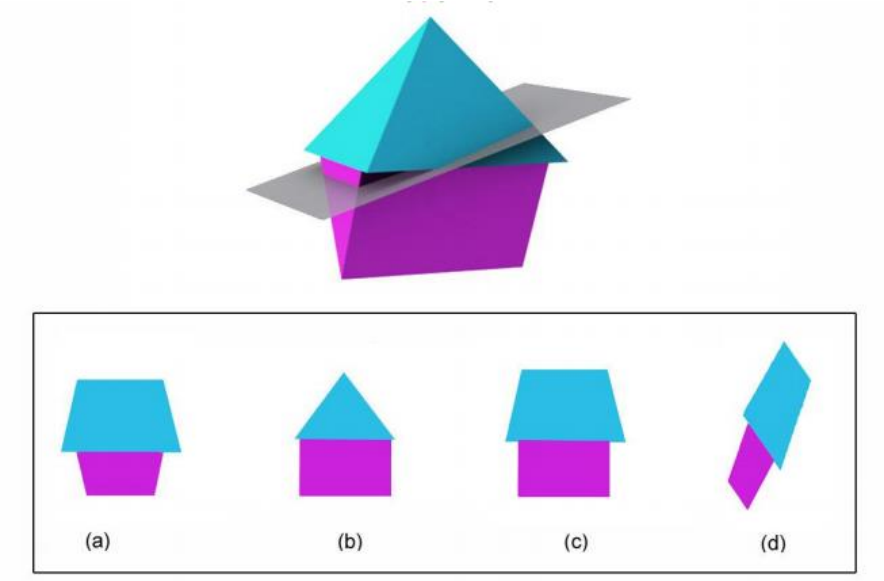
7. a. Describe in detail the solid formed by rotating a right triangle with vertices at (0, 0), (4, 0), and (0, 4) about the vertical axis. Include the dimensions of the solid in your description.

b. Would these dimensions change if you rotated it around the horizontal axis? Why or why not?

Draw the indicated cross section of the below figures.

8. 

9. 

10. 

Unit 6 – Volume and Cross Sections Review Answer Key

1) 235.5 or 79Π in^3

2) 527.52 or 168 Π m^3

3) Volume of the cylinder (popcorn tin) is 904.32 in^3 and the volume of the rectangular prism (popcorn box) is 896in^3. No, the popcorn will not fit in the box because the volume of the cylinder is greater.

4) Pi comes from the ratio of the circumference divided by the diameter.

5) The area of a circle equation is derived from dividing a circle into congruent infinitely many sectors then use those sectors to for a rectangle. This rectangle has the dimensions where the height is the radius and the base is ½ C which is πr. The area of this rectangle would then be $A = b \cdot h = \pi r \cdot r = \pi r^2$.

It takes the volume of 3 cones to fill the volume of one cylinder. Thus $3V_{cone} = V_{cylinder}$; then $V_{cone} = \frac{1}{3} V_{cylinder}$, so $V_{cone} = \frac{1}{3}\pi r^2 h$ The same concept applies to $V_{pyramid}$.

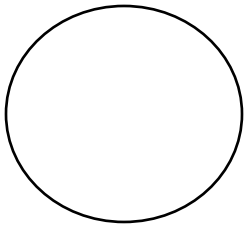
The volume of a cylinder is $V_{cylinder} = B \cdot h$. The B represents the area of the base and h, represents the height. This equation would then result in $V_{cylinder} = \pi r^2 \cdot h$.

6) Cylinder: radius of 2 and height of 2.

7a) Cone: radius of 4 and height of 4

b) Yes, it would be the same because of the position of the figure on the coordinate plane.

8) 

9) 

10) A