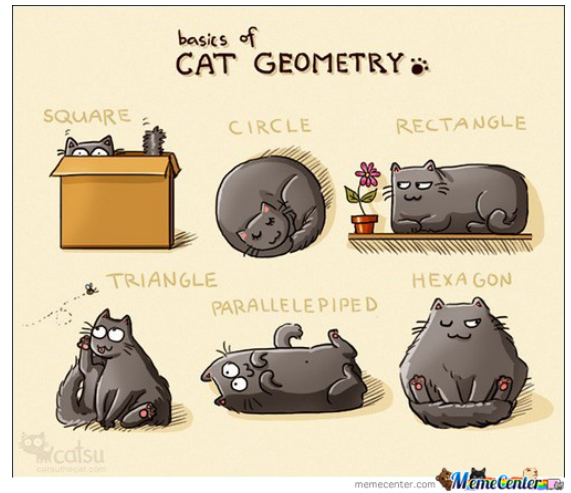


Name \_\_\_\_\_

# Math 3 Unit 3: Modeling With Geometry



				<p><b>February 15</b></p> <ul style="list-style-type: none"> <li>• Shapes and nets</li> <li>• Project assigned</li> </ul> <p>HW: 3.1, work on project</p>
<p><b>February 18</b></p> <ul style="list-style-type: none"> <li>• No School - Teacher Workday</li> </ul>	<p><b>February 19</b></p> <ul style="list-style-type: none"> <li>• Surface area</li> </ul> <p>HW: 3.2, work on project</p>	<p><b>February 20</b></p> <p>ACT</p> <p>HW: work on Project</p>	<p><b>February 21</b></p> <ul style="list-style-type: none"> <li>• Volume</li> <li>• Cross-sections</li> </ul> <p>HW: 3.3, work on project</p>	<p><b>February 22</b></p> <ul style="list-style-type: none"> <li>• Rotating 2D shapes to create 3D shapes</li> <li>• Geometric modeling</li> </ul> <p>HW: 3.4, 3.5, work on project</p>
<p><b>February 25</b></p> <ul style="list-style-type: none"> <li>• More geometric modeling</li> </ul> <p>HW: 3.6, work on project</p>	<p><b>February 26</b></p> <ul style="list-style-type: none"> <li>• Review for test</li> </ul> <p>HW: finish review, work on project</p>	<p><b>February 27</b></p> <ul style="list-style-type: none"> <li>• TEST!!!</li> </ul> <p>HW: complete project</p>	<p><b>February 28</b></p> <ul style="list-style-type: none"> <li>• Project presentations</li> </ul>	

### 3.1 - Nets and Shapes

Match the name of each 3D figure to its net.

\_\_\_\_\_ 1. triangular prism

\_\_\_\_\_ 2. square pyramid

\_\_\_\_\_ 3. hexagonal pyramid

\_\_\_\_\_ 4. rectangular prism

\_\_\_\_\_ 5. hexagonal prism

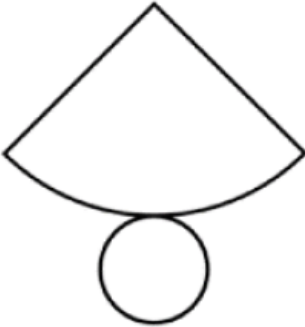
\_\_\_\_\_ 6. triangular pyramid

\_\_\_\_\_ 7. cylinder

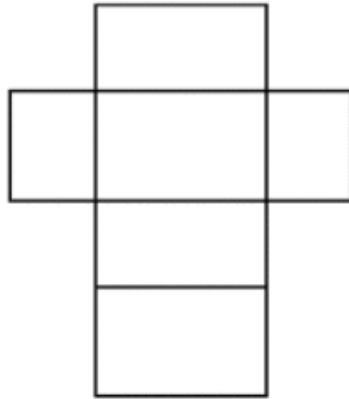
\_\_\_\_\_ 8. cube

\_\_\_\_\_ 9. cone

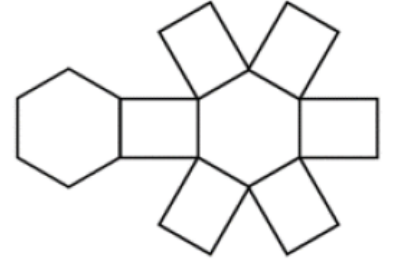
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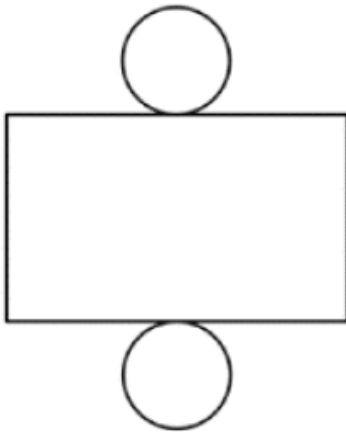
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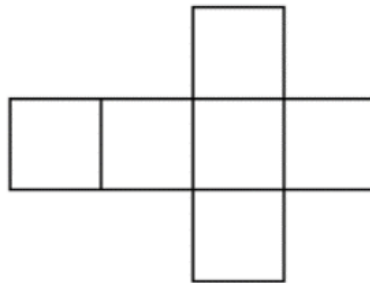
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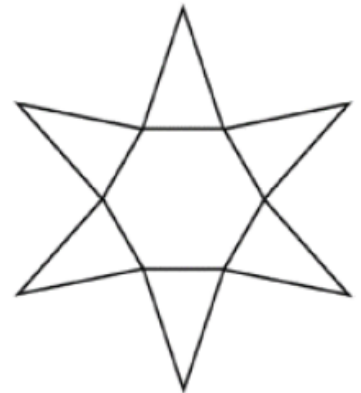
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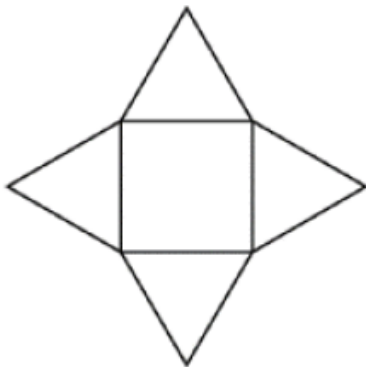
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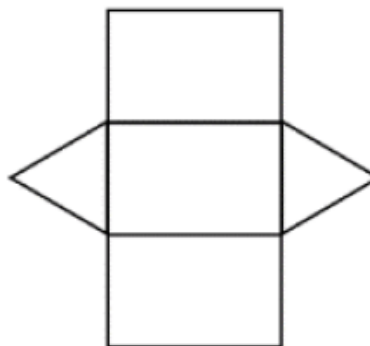
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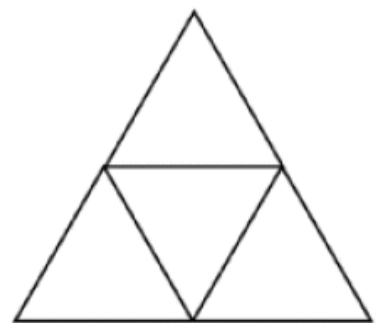
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H

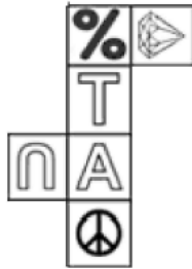


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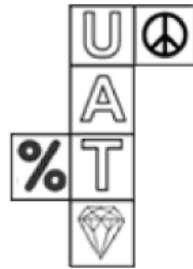


KEEP GOING -->

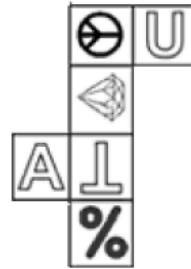
For each 3D cube given, match it to the correct corresponding net.



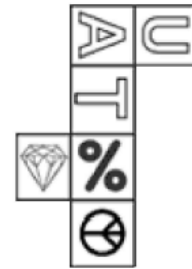
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b



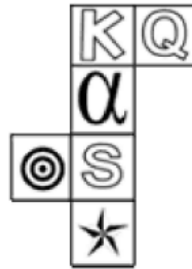
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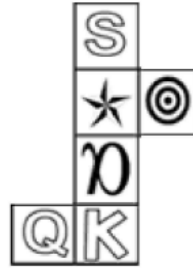
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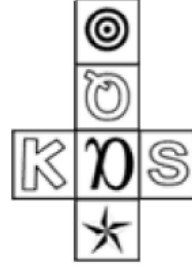
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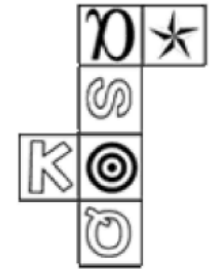
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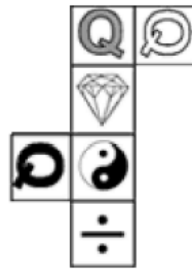
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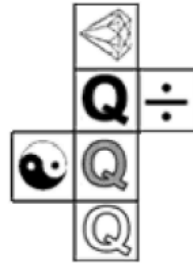
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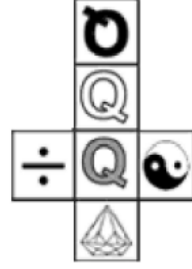
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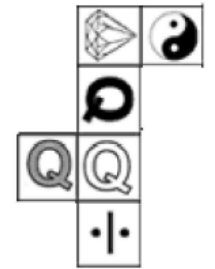
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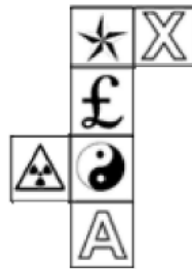
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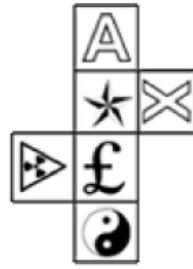
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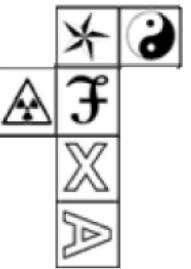
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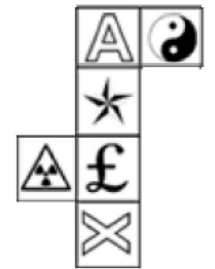
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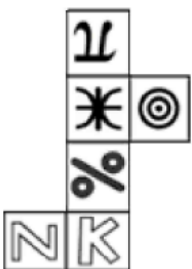
c



d



e



a



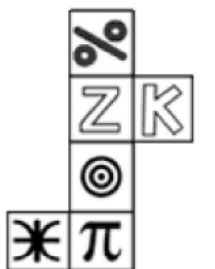
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c



d

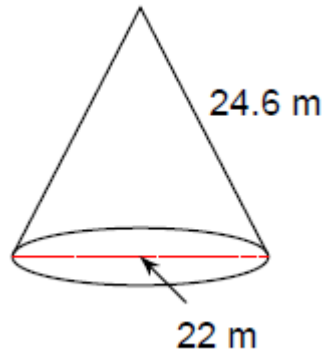


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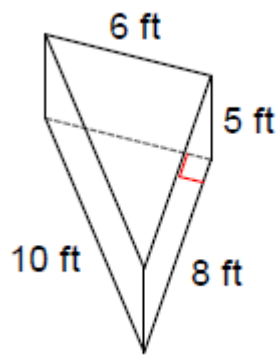
**3.2 - Surface Area**

Determine the surface area of each figure below.

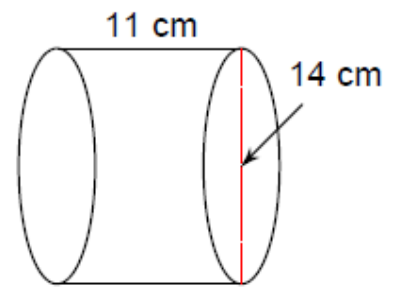
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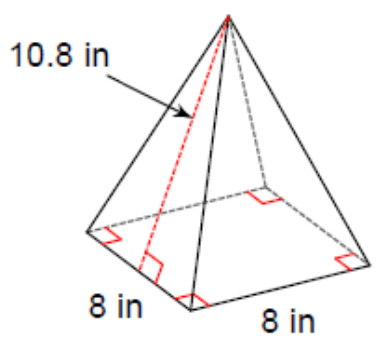
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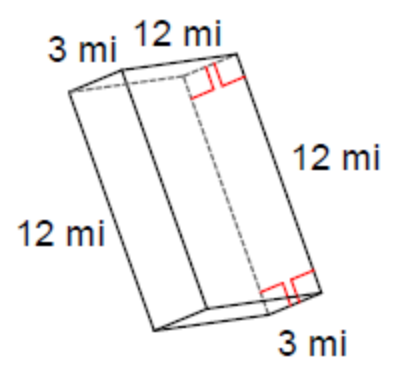
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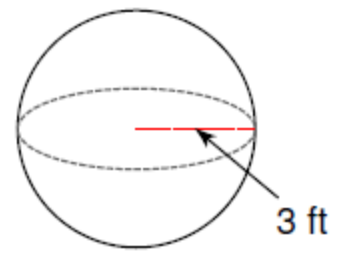
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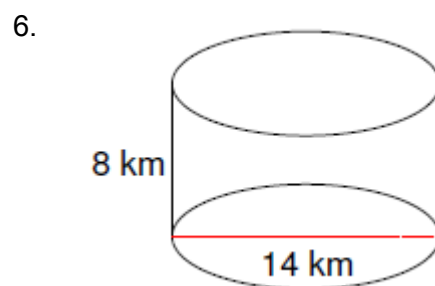
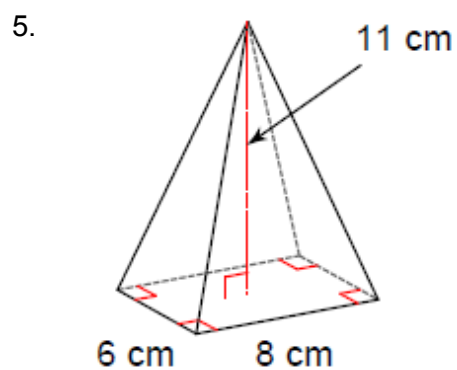
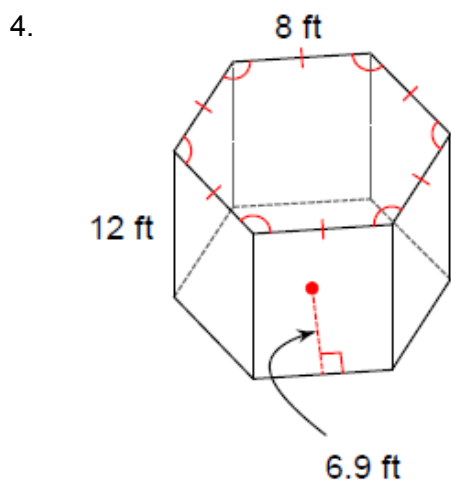
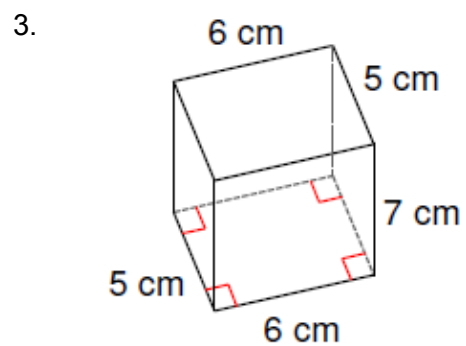
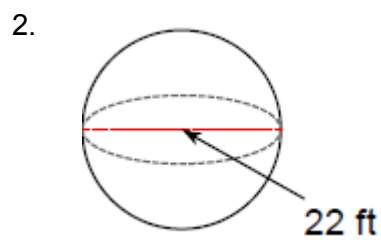
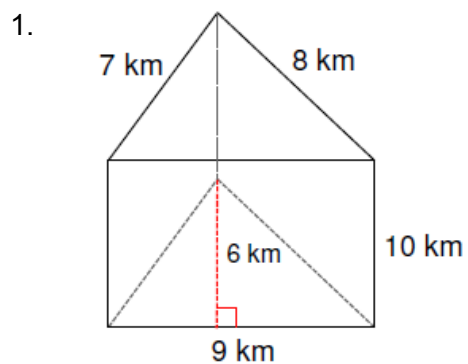


6



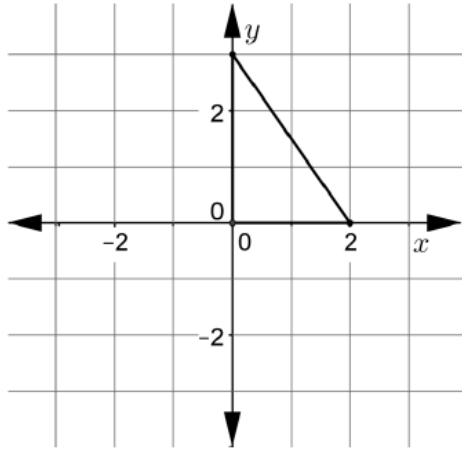
### 3.3 - Volume

Determine the volume of each figure below.

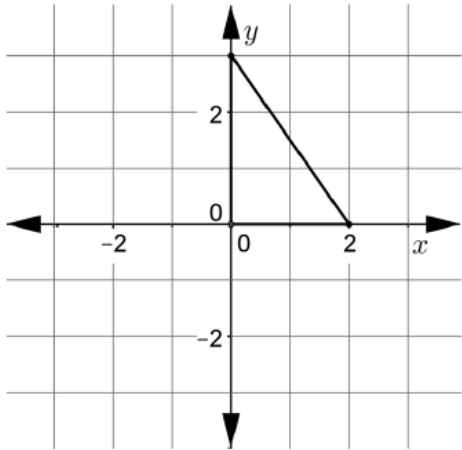


### 3.4 - Rotations of 2D Shapes to Create 3D Shapes

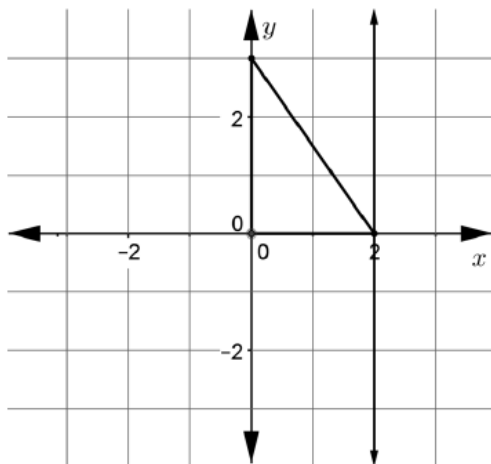
1. Describe in detail the solid formed by rotating a right triangle with vertices at  $(0, 0)$ ,  $(2, 0)$ , and  $(0, 3)$  about the vertical axis. Include the dimensions (height, length, width, radius, etc) of the solid in your description.



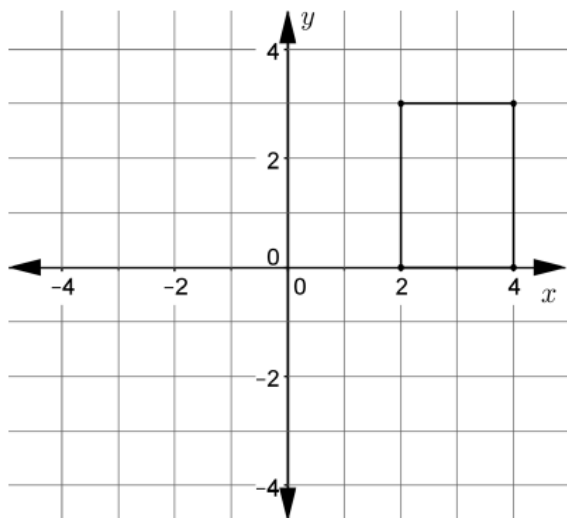
2. Describe in detail the solid formed by rotating a right triangle with vertices at  $(0, 0)$ ,  $(2, 0)$ , and  $(0, 3)$  about the horizontal axis. Include the dimensions (height, length, width, radius, etc) of the solid in your description.



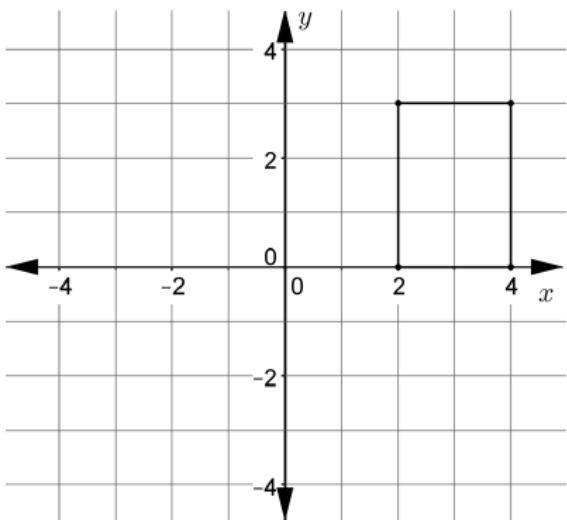
3. Imagine the solid formed by rotating the same right triangle about the line  $x = 2$ . Describe this solid in detail including its dimensions.



4. Describe in detail the solid formed by rotating a 2 x 3 rectangle with vertices  $(2, 0)$ ,  $(4, 0)$ ,  $(2, 3)$  and  $(4, 3)$  about the  $x$ -axis. Include the dimensions (height, length, width, radius, etc) of the solid in your description.



5. Describe in detail the solid formed by rotating a 2 x 3 rectangle with vertices  $(2, 0)$ ,  $(4, 0)$ ,  $(2, 3)$ , and  $(4, 3)$  about the  $y$ -axis. Include the dimensions (height, length, width, radius, etc) of the solid in your description.

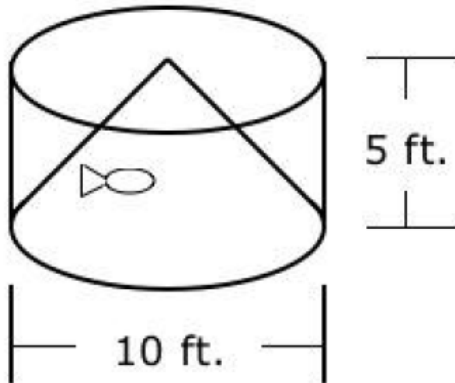


### 3.5 - Geometric Modeling

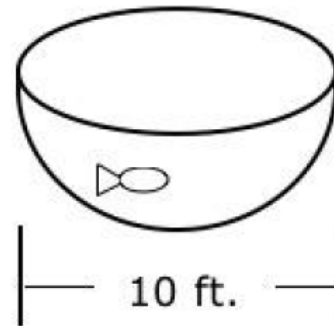
The management of an ocean life museum will choose to include either Aquarium A or Aquarium B in a new exhibit.

Aquarium A is a right cylinder with a diameter of 10 feet and a height of 5 feet. Covering the lower base of Aquarium A is an “underwater mountain” in the shape of a 5-foot-tall right cone. This aquarium would be built into a pillar in the center of the exhibit room.

Aquarium B is half of a 10-foot-diameter sphere. This aquarium would protrude from the ceiling of the exhibit room.



**Aquarium A**



**Aquarium B**

1. How many cubic feet of water will Aquarium A hold?

2. How many cubic feet of water will Aquarium B hold?

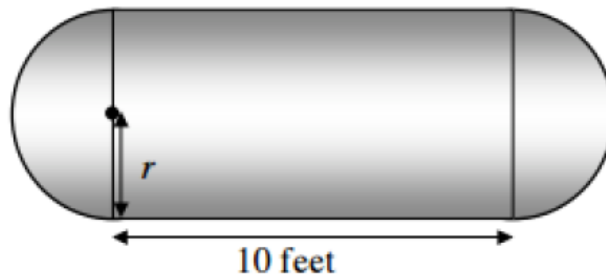




### 3.6 - More Geometric Modeling

People who live in isolated or rural areas have their own tanks of natural gas to run appliances like stoves, washers, and water heaters.

These tanks are made in the shape of a cylinder with hemispheres on the ends.



The Insane Propane Tank Company makes tanks with this shape, in different sizes. The cylinder part of every tank is exactly 10 feet long, but the radius of the hemispheres,  $r$ , will be different depending on the size of the tank.

1. The standard tank is 6 feet in diameter. What is the surface area of the standard tank?
2. What is the volume of the standard tank?
3. If the company wants to double the volume of their standard tank, what should the radius of the new tank be?



The Fresha Drink Company is marketing a new soft drink.

The drink will be sold in a can that holds  $200 \text{ cm}^3$ .

4. If the radius of Can A is 4cm, what is the height of the can?

5. If the height of Can B is 7cm, what is the radius of the can?

6. If the diameter of Can C is 8cm, what is the height of the can?

7. The Fresha Drink company wants to build their cans using the least amount of materials possible (smallest surface area). Which of the three can options should they select?