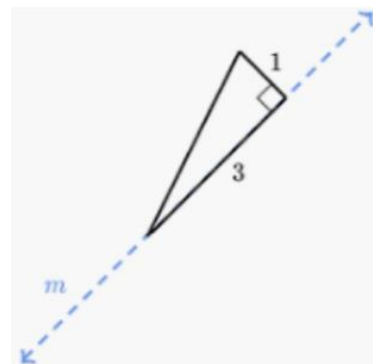
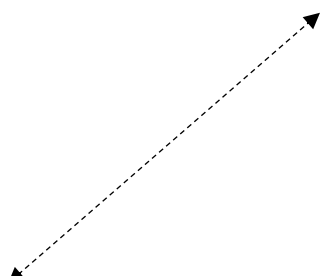
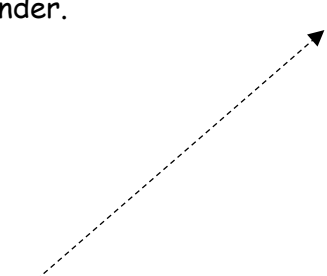
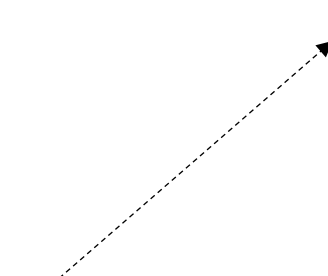


Solids of Rotation

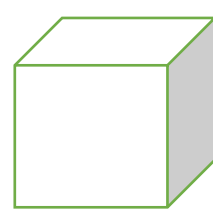
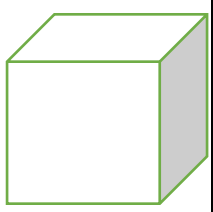
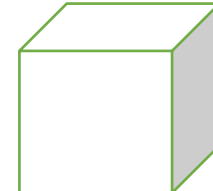
1. If you rotate the figure at right around line m , what 3D shape is formed? _____

Find the Volume of the resulting solid:



<p>2. Draw a 2D shape that when rotated would get you a sphere:</p> 	<p>3. Draw a 2D shape that when rotated would get you a cylinder.</p> 	<p>4. Draw 2D shape that when rotated would get you a pyramid</p> 
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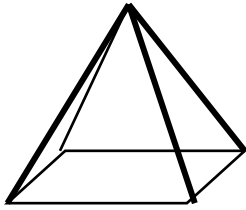
Cross sections of solids

<p>Can you find a way to slice a cube so that you will have a cross section that is a square? Sketch or explain:</p> 	<p>Show where you would slice it to get a rectangle.</p> 	<p>How about a triangle cross section? Would the triangle have to be equilateral? Isosceles? Neither? Explain!</p> 
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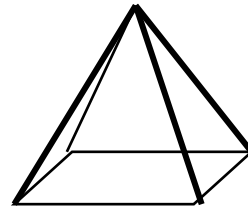
Any other shapes you can make by cross-sectioning a cube?

2. A square pyramid

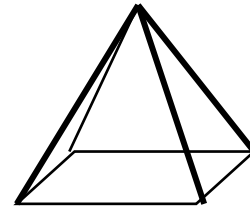
Can you find a way to slice it so that you will have a cross section that is a square?



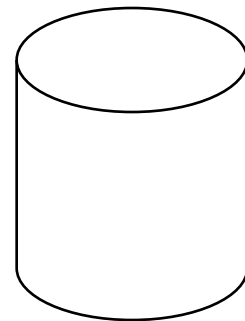
Show where you would slice it to get a rectangle.



List all the other cross-sectional shapes you could get:



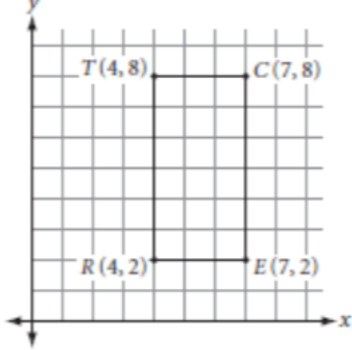
3. What shapes can you get by cross-sectioning a cylinder? Show or explain.



4. What shapes can you get by cross-sectioning a sphere? Show or explain.

Applications of volume and Solids of Rotation and cross sections

Practice: C-Level

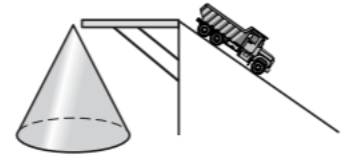
<p>1. Use rectangle RECT for this problem.</p> 	<p>Sketch the solid generated by revolving RECT about the y-axis (include lengths).</p>	<p>Calculate the volume of the solid.</p>
<p>What is the center point of rectangle RECT?</p>	<p>Find the circumference of the circle generated by revolving the point around the y-axis.</p>	<p>Multiply the circumference by the area of RECT.</p>
<p>How does the result compare with the volume you found in part a?</p>		

2. How many cubic inches are there in one cubic foot?

3. Jerry is packing cylindrical cans with diameter 6 in. and height 10 in. tightly into a box that measures 3 ft by 2 ft by 1 ft. All rows must contain the same number of cans. The cans can touch each other. He then fills all the empty space in the box with packing foam.

<p>How many cans can Jerry pack in one box?</p>	<p>Find the volume of packing foam he uses.</p>	<p>What percentage of the box's volume is filled by the foam?</p>
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4. The North County Sand and Gravel Company stockpiles sand to use on the icy roads. Sand is brought in by trailers that carry 12 cubic meters each. The engineers know that when the pile of sand, which is in the shape of a cone, is 17 m. across and 9 m. high they will have enough for a normal winter. How many truckloads are needed to build the pile?



B-Level

6. For Awards Night at Baddeck High School, the math club is designing small solid silver pyramids. The base of the pyramids will be a 2 in.-by-2 in. square. The pyramids should not weigh more than $2\frac{1}{2}$ pounds. One cubic foot of silver weighs 655 pounds. What is the maximum height of the pyramids?

7. The High Country Tent Company wants to produce a tent that provides adequate interior space for moving around and sleeping but uses a minimum amount of material. High Country has determined that the tent needs 60 cubic feet of space. They are considering three possible designs:

- a) A hemisphere tent
- b) A triangular prism tent. The floor would be a rectangle with dimensions 4 ft by 6 ft. The two triangular ends would be isosceles triangles with base length 4 ft.
- c) A square pyramid tent with height 5 ft.

a. Sketch each tent

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b. Find the height of the tallest person who can sleep stretched out in each tent.

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c. Which tent do you think the company should produce? Why?