

## Goals for Today

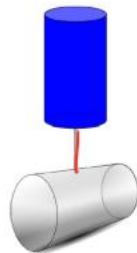
1. Identify Cross Sections in multiple scenarios
2. Identify the dimensions and describe the solid formed from rotating a 2D figure around an axis.

What is a cross section?

cross section-a surface or shape that is or would be exposed by making a straight cut through something, especially at right angles to an axis

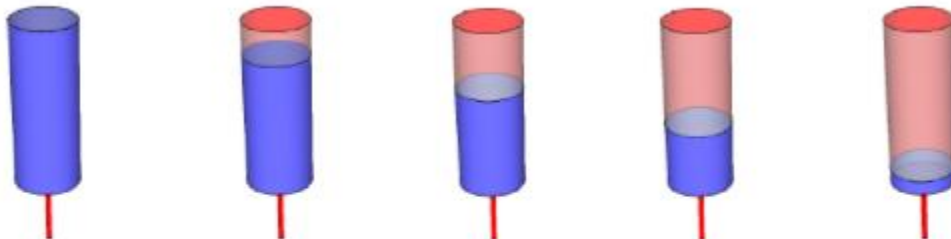
Imagine the following:

The top cylinder is filled with water, and is being emptied into the bottom cylinder.



What would the cross sections of the top cylinder look like as it emptied?

3D View:



Top view – surface of water:



3D View:

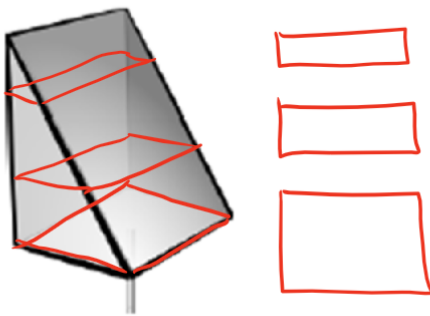


Top view – surface of water:

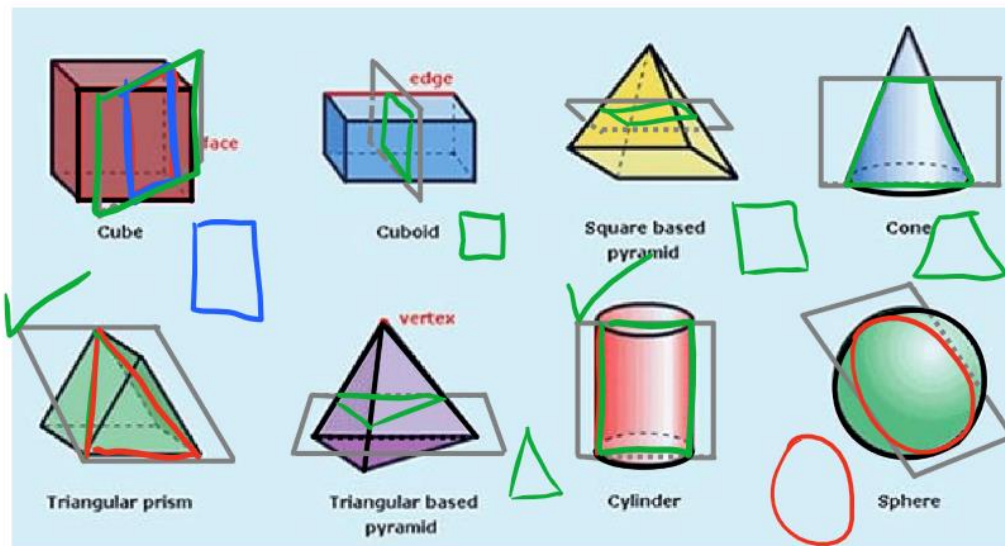


What would a cross section looking from the above, look like as the follow image emptied?

1. Triangular prism

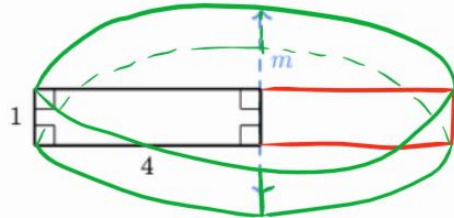


Cross Sections: Identify what the cross section would look like in the following.



Now let's look at what happens when a 2D shape is rotated around a given axis.

Consider the following figure:

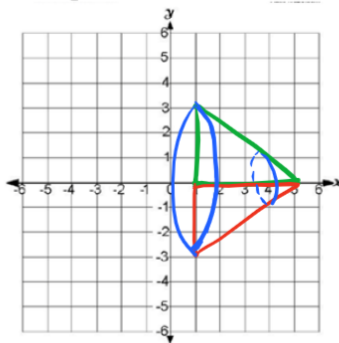


What solid 3D object is produced by rotating the rectangle about line  $m$ ?

Cylinder with a radius of 4 and a height of 1.

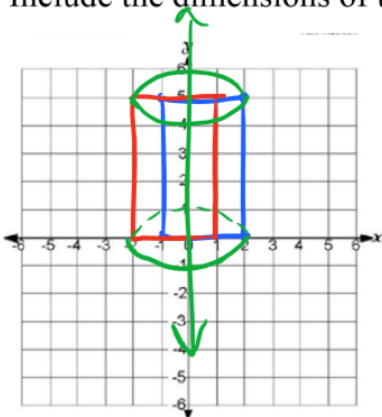
What if it was on the coordinate plane?

Describe in detail the solid formed by rotating a triangle with vertices  $(1, 0)$ ,  $(5, 0)$ , and  $(1, 3)$  about the  $x$ -axis. Include the dimensions of the solid in your description.



A cone with a radius of 3 and a height of 4.

Describe in detail the solid formed by rotating a  $3 \times 5$  rectangle with vertices  $(-1, 0)$ ,  $(2, 0)$ ,  $(-1, 5)$  and  $(2, 5)$  about the vertical axis. Include the dimensions of the solid in your description.



A cylinder with a radius of 2 and a height of 5.