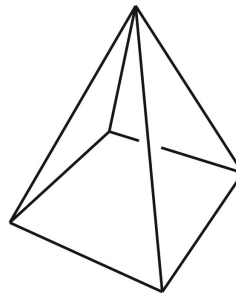
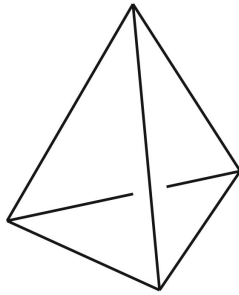
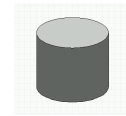


Problem set 4. (Assigned on October 10th)

1. Consider the tetrahedron (triangular pyramid) in the picture on the left. What kinds of polygons can you get by slicing it with a plane? (Triangle? Quadrilateral? Pentagon? Hexagon?) What kinds of polygons can you get when you slice the pyramid on the right? Can you guess what happens when you slice a pyramid whose base is a pentagon?



3. Suppose you cut a solid vertical cylinder with a plane. Draw all possible types of cross sections that you can get.



4. (This is a follow-up to a problem assigned last time.) The queen of the ancient land of Figuria once asked the court mathematician, RightAngleus, to devise a way to cut a square into any number of smaller squares that is greater than six. (Bigger squares that are composed of smaller squares should not be counted.)

The mathematician worked day and night and solved the problem. The manuscript with the solution was later damaged in a fire, and only a few lines survived. These were:

“First, show how to cut a square into 7, 8, and 9 smaller squares: ... If you want to cut a square into a bigger number of squares, you should ...”

Restore RightAngleus' solution.

3. Move four sticks to leave just three equilateral triangles. (The triangles do not need to be the same size.)

