Math 191 Fundamentals of Mathematics II
13.1 and 13/2: Polyhedra and Other Solid Shapes; Patterns and Surface Area
March 17, 2014

Prisms, Cylinders, Pyramids, and Cones

A *right prism* is a polyhedron with two faces called _____ that are _____. All other faces connect the two bases and are _____.

The more general definition of *prism* does not require the faces connecting the bases to be rectangles. Instead, we only require that they are _____. Sometimes, a prism that is not a right prism is called an _____.

We can name prisms for the shapes of their bases. A prism where the bases are triangles is called a _____ prism. A prism where the bases are rectangles is called a _____ prism.

Often, when someone says *cylinder* they mean a shape very much like a right prism, but whose bases are _____ and whose sides are curved. A cylinder is not a polyhedron because _____.

There are other types of cylinders, though. Like prisms, we could have oblique cylinders, or cylinders whose bases are closed curves besides circles, such as _____. As with a prism, though, both bases must _____.

A *pyramid* is a shape that one can describe like this: Start with any _____ and a _____ (called the _____) not in the plane of the polygon. Connect this point to each of the vertices of the polygon; these line segments will be _____ of the pyramid, and together they will form polygons that, together with the original polygon, make up the _____ of the pyramid.

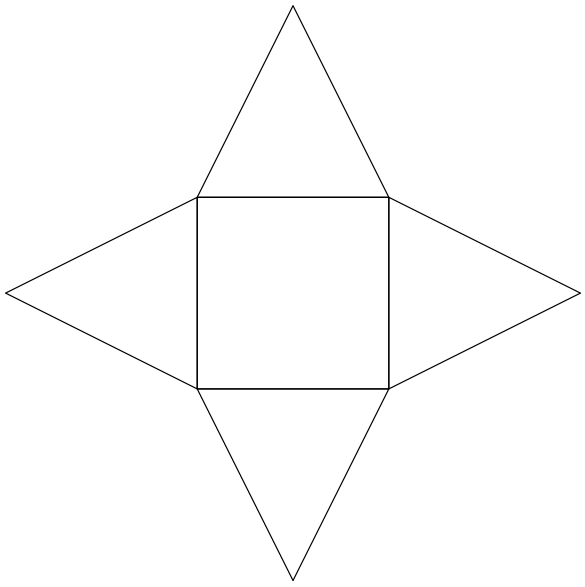
Cones are related to pyramids the way cylinders are related to prisms. You start with a _____ in a plane and a _____ not in that plane. Now connect that top point to all the points on the curve.

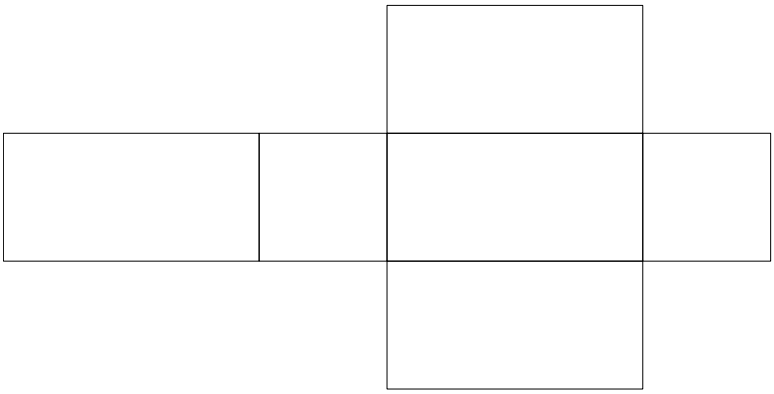
Like prisms and cylinders, there are _____ pyramids and cones (ones where the apex is directly over the _____ of the base) and oblique pyramids and cones (ones where the apex is not _____).

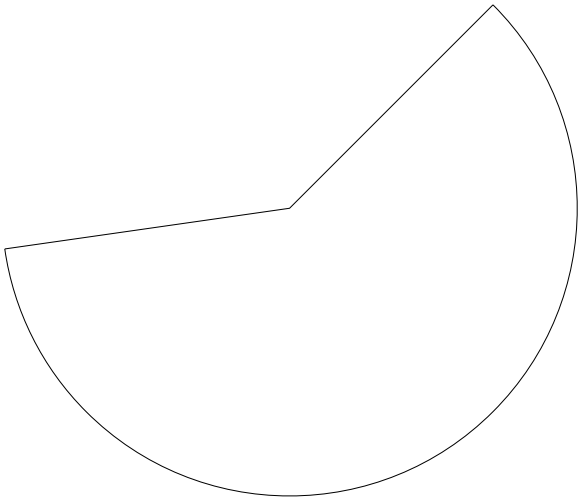
Let's list some examples of prisms, cylinders, pyramids and cones we've encountered:

Patterns and Surface Area We can make a pattern for any of these shapes out of paper, and by folding or bending the paper as needed, recreate the three-dimensional shapes.

For example:







Using these patterns, we can find the surface area of various shapes. For example, we can assign dimensions to the shapes made by the patterns above to find their surface areas.