Math 191 Fundamentals of Mathematics II
13.1: Polyhedra and Other Solid Shapes
March 14, 2014

We will start learning about three-dimensional shapes. These shapes are all around us and are familiar to most students. As usual, we will investigate the properties of these shapes systematically.

Polyhedra

A polyhedron is a _____ shape whose outer surface is made up of _____. These polygons are called _____ and where two of the polygons meet is called an _____. A corner where multiple faces meet at a point is called a _____. (Note: The plural of polyhedron is _____. The plural of vertex is _____.)

Platonic Solids

The Platonic solids are _____.

The Platonic solids are:

- Tetrahedron:
- Cube:
- Octahedron:
- Dodecahedron:
- Icosahedron:

What makes the Platonic solids special is that all their faces are _____ and the same number of faces _____. The Platonic solids are the only convex three-dimensional shapes with these properties.

A shape is convex if _____. In simple terms, a convex shape has no _____ or _____.

1. What is the difference between a square and a cube? What is the difference between a triangle and a tetrahedron?

2. What would happen if you tried to make a convex polyhedron whose faces were all equilateral triangles, and which had six triangles meeting at every vertex?

3. Could you make a convex polyhedron that had seven or more equilateral triangles meeting at each vertex?