A&S 153
#3 Coordinates

What are the coordinates of the corners (*vertices*) of some of the polyhedra that we have encountered so far?

1. Make a sketch of a cube and find a possible set of coordinates for each of its eight vertices. Suggestion: Try to center it around the origin $(0, 0, 0)$, and give one vertex the coordinates $(1, 1, 1)$.

2. A tetrahedron is the polyhedron based on the space cluster $(3, 3, 3)$. Look at a model or sketch of a cube, and find a way to use some of its vertices to obtain the vertices of a tetrahedron. There are two ways to do this. Draw a good sketch to illustrate this.

3. An octahedron is the polyhedron based on the space cluster $(3, 3, 3, 3)$. Construct a model, make a good sketch, and find convenient coordinates for its vertices. Suggestion: Try to center it conveniently around the origin.

4. A cuboctahedron is the polyhedron based on the space cluster $(3, 4, 3, 4)$. Construct a model, make a good sketch, and find convenient coordinates for its vertices. Suggestion: Think about an easy way to "get" the cuboctahedron from a cube.

5. Carry out the same exercise for the truncated tetrahedron, which is based on the space cluster $(3, 6, 6)$.