Homework 4: (20 points each)

1) The composite transformation matrix $M=TRT^{-1}$ is applied to set of vertices. Which of the component transformations is the first one applied? What does this imply about how you should build your composite transformations?
2) Imagine you have two right handed frames, one with representation in terms of the vectors [i j k] and another with corresponding vectors [u v w]. For every unit we move in the [i j k] frame we move 2 units in the [u v w] frame and the origin of the [u v w] frame can be represented at [4i 6j 2k]. Derive the transform $M_{[ijk]<-[uvw]}$ such that, when applied to any point P in [u v w] we get its representation in [i j k]. Show how you accomplished this.
3) How can you tell if a homogenous transformation matrix is a pure rotation? A rotation about X? Y? Z? Why?
4) How can you tell if a homogenous matrix is a pure translation?
5) How can you tell if a homogenous matrix is a rigid body transformation?