CMPE 360
Hands-On Activity 2

Name(s):

1. Mark either True or False:

True/False:: ___	If you want a rotation of 270 degrees around the z-axis, the value in the first (top) row, second column should be $sin(270)$.
True/False:: ___	The cross product of two parallel 3D vectors is the zero vector (0, 0, 0).
True/False:: ___	Rigid transformations include the scaling and shear transformation.
True/False:: ___	Any affine transformation in a 3D space can be described by a 3x3 matrix
True/False:: ___	For any two transformations, A and B, we get the same result if we apply A before B as if we apply B before A.

2. Find an *implicit equation* for the plane containing the triangle ($\mathbf{v_1}$, $\mathbf{v_2}$, $\mathbf{v_3}$). The equation should have the form:

$$f(\mathbf{p}) = N \cdot (\mathbf{p} - \mathbf{q}) = 0$$

where N is a normal to the plane and **q** is a point in the plane.

Find N and **q** in terms of the triangle vertices. Show your steps.

3. (10 points) What are the ray parameters of the intersection points between ray $(2,\ 2,\ 2) + t\ (-1,\ -1,\ -1)$ and the sphere centered at the origin with radius 1? Outline your approach, show the steps, but you do not need to compute final *t* value.