**CMPUT 414: Winter 2014**

**Lab2, due date Jan 23, 2015, 23:59 PM**

1. **3D Transformations**

a) What is the homogenous transformation matrix for:

i) Translation of (20, -30, 30)

(x,y,z)+(20,-30,30)= (x+20,y-30,z + 30)

ii) Followed by Scaling with (2, -2, 2)

iii) Followed by Rotation of 45 degrees around Z-axis

b) Apply the above final transformation matrix to a 3D point at (5, 3, 4).

c) If after the same transformations as in (a), we get the resulting 3D point (10, 40, -20), what is the original 3D point?

d) Rotate the vector from the origin to  by an angle 60 around direction (-1, 1, 1).