# Written Assignment 2 Solution

1A) a=0, d=0

1B) c= 1/sqrt(2) or – 1/sqrt(2)

1C) e= – 1/sqrt(2) , f = 1/sqrt(2)

2A) x= sqrt(3)/2, - sqrt(3)/2

y= 0

z= -1/2, + 1/2

3) Most of you got it right this time but I guess some are still confused. I think I should rephrase what I said in the last homework solution – "v' = A*B*C*v = A*(B*(C*v))) where A,B,C are transformations that occur in that order" – **order here refers to their order in the opengl code**. So A occurs first in the CODE followed by B and then C. But what OpenGL does is multiply the input vertices with C first then B then A.

For this question we need opengl to first multiply the origin with M (modeling transformation) then C (camera transformation) and then P (projection transformation).

When I say multiply first with M and then C, P I mean
(P x (C x (M x V))). This will give the correct answer for this question –

[-3; 1; 1; -8 ] but we need to keep w=1 so divide by -8. And the answer is –

x= 3/8

y= -1/8

So now if you had to write this in OpenGl code you have to apply them in the reverse order – first P then C then M.

4) e = (5, 5, 5)
   t = (0, 1, 0)
   g = (0, -5, -5)

   w = (0, 1, 1) / sqrt(2)
   u = (1, 0, 0)
   v = (0, 1, -1) / sqrt(2)

   Mcam = [ u v w e ] -1
            0 0 0 1