# Exercises on the Viewing Pipeline

1) A fixed TV camera records a football match from a pt $V(4,3,2,1)$. The camera has reference system $\{O(4,4,4,1), X=(1,-1,0,0), Y=(-3,-3,-1,0)\}$. Observe that the plane of the camera has equation $2x_1+2x_2-3x_3-4(x_4)=0$.

Give the plane coordinates (the coordinates we see on the camera screen) for a point of the space. We assume that the camera has unlimited screen.

2a) Determine the projection of the cube with vertices $O(0,0,0,1)$, $A(2,0,0,1)$, $B(2,2,0,1)$, $C(0,2,0,1)$, $C'(0,2,2,1)$, $B'(2,2,2,1)$, $A'(2,0,2,1)$, $D'(0,0,2,1)$, on the plane $x_1+2x_2-2x_3-16(x_4)=0$, from the ideal pt $V(1,2,-2,-16)$

b) Calculate the plane-coordinates of the vertices of the cube if the coordinate system of the plane is $\langle O(8,4,0,1), X=(2,1,2,0), Y=(2,-2,1,0)\rangle$