Question 3.1:

$$M_1 = rotY\_mat(-\arctan\left(\frac{a_x}{a_z}\right))$$

$$M_2 = rotZ\_mat(\theta)$$

$$where\ \theta = \arcsin\left(\frac{a_z}{\sqrt{a_x^2 + a_y^2 + a_z^2}}\right) + \frac{\pi}{2}$$

$$M_3 = rotX\_mat(\lambda)$$

Question 4:

$$M_1 = \begin{bmatrix} 1 & 0 & 0 & -P_{nx} \\ 0 & 1 & 0 & -P_{ny} \\ 0 & 0 & 1 & -P_{nz} \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$M_2 = \begin{bmatrix} u_x & u_y & u_z & 0 \\ v_x & v_y & v_z & 0 \\ w_x & w_y & w_z & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$M_3 = \begin{bmatrix} 2/\theta_w & 0 & 0 & 0 \\ 0 & 2/\theta_h & 0 & 0 \\ 0 & 0 & 1/far & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$M_4 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$