3.1 $[x' \; y' \; 1] = [x \; y \; 1] [M]$

$$T^{-1} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -x_c & -y_c & 1 \end{bmatrix} \quad S = \begin{bmatrix} s_x & 0 & 0 \\ 0 & s_y & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad T = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ x_c & y_c & 1 \end{bmatrix}$$

$$ST = \begin{bmatrix} s_x & 0 & 0 \\ 0 & s_y & 0 \\ x_c & y_c & 1 \end{bmatrix} \quad T^{-1}ST = \begin{bmatrix} s_x & 0 & 0 \\ 0 & s_y & 0 \\ x_c - x_c s_x & y_c - y_c s_y & 1 \end{bmatrix}$$

$$T^{-1}ST = \begin{bmatrix} s_x & 0 & 0 \\ 0 & s_y & 0 \\ x_c - x_c s_x & y_c - y_c s_y & 1 \end{bmatrix}$$

3.2

$$T^{-1} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -C_x & -C_y & -C_z & 1 \end{bmatrix} \quad S = \begin{bmatrix} S_x & 0 & 0 & 0 \\ 0 & S_y & 0 & 0 \\ 0 & 0 & S_z & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad T = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ C_x & C_y & C_z & 1 \end{bmatrix}$$

$$ST = \begin{bmatrix} S_x & 0 & 0 & 0 \\ 0 & S_y & 0 & 0 \\ 0 & 0 & S_z & 0 \\ C_x & C_y & C_z & 1 \end{bmatrix}$$

$$T^{-1}ST = \begin{bmatrix} S_x & 0 & 0 & 0 \\ 0 & S_y & 0 & 0 \\ 0 & 0 & S_z & 0 \\ C_x - C_x S_x & C_y - C_y S_y & C_z - C_z S_z & 1 \end{bmatrix}$$