VR Assignment 2

Bryce Bartlett, Shane Chia

September 2019

1 Answer

Roll counterclockwise by $\pi/2$ Move X by -1 and move Y by 2

2 Answer

$$T_2 = \begin{bmatrix} cos(45) & 0 & sin(45) & 3 \\ 0 & 1 & 0 & 0 \\ -sin(45) & 0 & cos(45) & 2 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

3 Answer

$$(T_2T_1)^{-1} = \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 & 0 \\ -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 2 & 0 & 1 \end{bmatrix} \begin{bmatrix} cos(45) & 0 & -sin(45) & 0 \\ 0 & 1 & 0 & 0 \\ sin(45) & 0 & cos(45) & 0 \\ 3 & 0 & 2 & 1 \end{bmatrix}$$

4 Answer

$$q_1 = \begin{bmatrix} (\frac{1}{\sqrt{2}}x - \frac{1}{\sqrt{2}}y - 1) & (\frac{1}{\sqrt{2}}x + \frac{1}{\sqrt{2}}y + 2) & z & 1 \end{bmatrix}$$

$$q_2 = \begin{bmatrix} (cos(45)x + sin(45)z + 3) & y & (-sin(45)x + cos(45)z + 2) & 1 \end{bmatrix}$$