Assignment 2

William Setzer

January 28, 2019

Question 1

$$trans_1 = \begin{bmatrix} 1 & 0 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix} \quad scale_1 = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad trans_2 = \begin{bmatrix} 1 & 0 & -3 \\ 0 & 1 & -2 \\ 0 & 0 & 1 \end{bmatrix}$$

$$trans_2 * scale_1 * trans_1 = \begin{bmatrix} 2 & 0 & -3 \\ 0 & 2 & -2 \\ 0 & 0 & 1 \end{bmatrix}$$

Question 2

$$scale_1 = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Question 3

$$scale_1 = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad trans_1 = \begin{bmatrix} 1 & 0 & -3 \\ 0 & 1 & -2 \\ 0 & 0 & 1 \end{bmatrix}$$

$$trans_1 * scale_1 = \begin{bmatrix} 2 & 0 & -3 \\ 0 & 2 & -2 \\ 0 & 0 & 1 \end{bmatrix}$$

Question 4

$$reflect_1 = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Question 5

$$rotate_1 = \begin{bmatrix} cos\frac{\pi}{4} & -sin\frac{\pi}{4} & 0 \\ sin\frac{\pi}{4} & cos\frac{\pi}{4} & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} & 0 \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad scale_1 = \begin{bmatrix} \frac{1}{\sqrt{2}} & 0 & 0 \\ 0 & \frac{1}{\sqrt{2}} & 0 \\ 0 & & 1 \end{bmatrix}$$

$$rotate_1 * scale_1 = \begin{bmatrix} \frac{1}{2} & -\frac{1}{2} & 0 \\ \frac{1}{2} & \frac{1}{2} & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Question 6

$$trans_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 100 \\ 0 & 0 & 1 \end{bmatrix} \quad reflect_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$trans_1 * reflect_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 100 \\ 0 & 0 & 1 \end{bmatrix}$$