Math 10460 - Honors Mathematics II
Homework 9b - Due Wednesday, March 23

You must show your work in all of the problems!!!

(6) Write down a matrix which gives a rotation about the point $(2, -1)$ by $\dfrac{\pi}{2}$.

(7) Verify that the matrix $\begin{pmatrix} a & b & x_0 \\ c & d & y_0 \\ 0 & 0 & 1 \end{pmatrix}$ does the matrix $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ *then* the translation $\tau_{(x_0, y_0)}$ by computing the products

$$\begin{pmatrix} 1 & 0 & x_0 \\ 0 & 1 & y_0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} a & b & 0 \\ c & d & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

and

$$\begin{pmatrix} a & b & 0 \\ c & d & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 & x_0 \\ 0 & 1 & y_0 \\ 0 & 0 & 1 \end{pmatrix}.$$

The top product does the matrix $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ first, then the translation, and the bottom product does them in the opposite order. What is the difference between the two products?