You will have 8 minutes to complete this quiz. No books, notes, or other aids are permitted.

Problem 1 (Problem 1 points)
A square with a letter (shown in the diagram labeled “orig” below) is transformed into each of the configurations (a)-(c). In each case, identify the type of transform and, if possible, find a $3 \times 3$ homogeneous transform matrix corresponding to it. In each case, identify the transform as a R=rotation, T=translation, S=uniform scale, X=none of these. R, S, and T can be combined. The most restrictive option should be chosen. Thus, a transform that can be accomplished by a combination of rotation and uniform scale should be described as R+S, not as X.

(a) R. \[
\begin{pmatrix}
0 & -1 & 0 \\
1 & 0 & 0 \\
0 & 0 & 1
\end{pmatrix}
\]
(b) T. \[
\begin{pmatrix}
1 & 0 & -1 \\
0 & 1 & -2 \\
0 & 0 & 1
\end{pmatrix}
\]
(c) S+T. \[
\begin{pmatrix}
2 & 0 & -1 \\
0 & 2 & -1 \\
0 & 0 & 1
\end{pmatrix}
\]