# CS 230, Quiz 4

Solutions

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

Problem 1

The unit square $[0, 1] \times [0, 1]$ is transformed to each of the polygons below. (a) In each case, identify the type of transform: **R**=rotation, **T**=translation, **S**=uniform scale, **U**=non-uniform scale. These can be combined. (For example, "**RT**" if both rotation and translation are required.) If this cannot be done, then indicate "**X**" as the type. (b) If you did not respond "**X**" then construct a suitable transform matrix. (You may write it as the product of primitive matrices, or you may provide the final transform matrix as a single matrix. It does not matter how you construct the transform.)
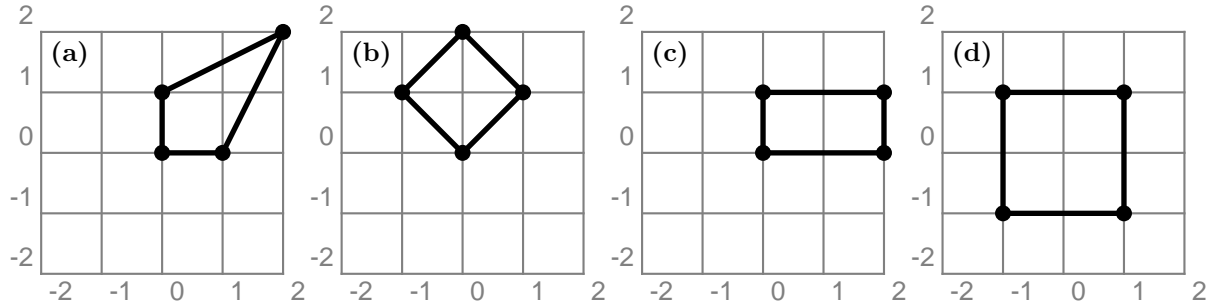
(a) Type X. Note that each of the primitive transform types (R, T, S, U, H) preserve parallel lines, which is not the case here.

(b) RS. $\begin{pmatrix} 1 & -1 & 0 \\ 1 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

(c) U. $\begin{pmatrix} 2 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

(d) ST. $\begin{pmatrix} 2 & 0 & -1 \\ 0 & 2 & -1 \\ 0 & 0 & 1 \end{pmatrix}$