

In each case, find a 3×3 matrix that produces the 2D transformation in homogeneous coordinates. Use *Mathematica* to verify your answer.

1. Translate by $(2, 5)$ then reflect across the x -axis
2. Reflect across the x -axis then translate by $(2, 5)$
3. Rotate by $\frac{3\pi}{4}$ counter-clockwise about the point $(-3, 2)$