

1. Compute $\rho_{\begin{bmatrix} 0 \\ 1 \end{bmatrix}, \frac{\pi}{2}} \rho_{\begin{bmatrix} 1 \\ 0 \end{bmatrix}, \frac{\pi}{2}}$ explicitly.
2. Compute $\tau_{O, \begin{bmatrix} 0 \\ 2 \end{bmatrix}} \rho_{O, \frac{\pi}{3}}$ explicitly.
3. Let ℓ be the line $y = 2x + 5$, m the line $y = 2x + 1$, and n the line $y = -\frac{1}{2}x$. Calculate the following explicitly:
 - a) $\sigma_n \sigma_\ell$
 - b) $\sigma_n \sigma_m$
 - c) $\sigma_m \sigma_\ell$.
4. Let ℓ be the line $y = 0$ (the x -axis), m the line $x = 0$ (the y -axis), n the line $y = \sqrt{3}x$. Compute the following explicitly:
 - a) $\sigma_n \sigma_\ell \sigma_m$
 - b) $\sigma_n \sigma_\ell \sigma_n$.