

Perform the following matrix multiplications. Round all answers to three decimal places. Caution: Be sure your calculator or computer application is in *degree mode*. Sometimes the default is radian mode, which will result in incorrect answers!

1. 
$$\begin{bmatrix} 3 & -1 \\ 5 & 2 \end{bmatrix} \begin{bmatrix} -4 & 6 \\ 2 & -2 \end{bmatrix}$$

2. 
$$\begin{bmatrix} -4 & 6 \\ 2 & -2 \end{bmatrix} \begin{bmatrix} 3 & -1 \\ 5 & 2 \end{bmatrix}$$

3. 
$$\begin{bmatrix} 1 & 2 \\ -2 & 1 \end{bmatrix} \begin{bmatrix} \cos(40^\circ) & -\sin(40^\circ) \\ \sin(40^\circ) & \cos(40^\circ) \end{bmatrix}$$

4. 
$$\begin{bmatrix} 0.75 & 0 \\ 0 & 0.5 \end{bmatrix} \begin{bmatrix} \cos(70^\circ) & -\sin(70^\circ) \\ \sin(70^\circ) & \cos(70^\circ) \end{bmatrix}$$

Answers:

1. 
$$\begin{bmatrix} -14 & 20 \\ -16 & 26 \end{bmatrix}$$

2. 
$$\begin{bmatrix} 18 & 16 \\ -4 & -6 \end{bmatrix}$$

3. 
$$\begin{bmatrix} 2.052 & 0.889 \\ -0.889 & 2.052 \end{bmatrix}$$

4. 
$$\begin{bmatrix} 0.257 & -0.705 \\ 0.470 & 0.171 \end{bmatrix}$$