

1. Solve for the indicated variables:

$$\text{a) } \begin{bmatrix} 1 & 2 \\ c & d \end{bmatrix} \times \begin{bmatrix} 1 & a \\ b & 2 \end{bmatrix} = \begin{bmatrix} 5 & 4 \\ 11 & 8 \end{bmatrix} \qquad \text{b) } \begin{bmatrix} 2 & 1 & 0 \\ -1 & 2 & 4 \end{bmatrix} \times \begin{bmatrix} a \\ 0 \\ b \end{bmatrix} = \begin{bmatrix} 6 \\ 1 \end{bmatrix}$$

2. Perform the indicated multiplication. Do it first by hand, then verify with a calculator.

$$\text{a) } \begin{bmatrix} 2 & 1 & 0 \\ 4 & -2 & 3 \\ 0 & 1 & -1 \end{bmatrix} \times \begin{bmatrix} 5 \\ 0 \\ 2 \end{bmatrix} \qquad \text{b) } \begin{bmatrix} 5 & 1 \\ -3 & 2 \end{bmatrix}^2$$

3. Let $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$ Find each of these:

a) $A \times B$

b) $B \times A$

4. a) Find a *non-zero* 2×2 matrix, A , such that $A \times \begin{bmatrix} 2 & 4 \\ 4 & 8 \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

Start with $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and work from there.

b) Can you find A such that $A \times A = 0$?

(Hint: start with $\begin{bmatrix} a & b \\ c & d \end{bmatrix}^2 = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ and see where it leads you!)

5. If A is a 3×5 matrix and C is a 3×4 matrix, then what order is B if $A \times B = C$?