

Practice adding and multiplying matrices and vectors! The answer for each problem is given, so it's up to you to show the work required to find it. In a few cases, the operation is not defined. Provide a brief explanation on why that would be in each case.

1. Show at least one intermediate step to reach the given answer, or explain why the operation is not defined.

(a)  $\begin{bmatrix} 3 \\ -2 \\ 1 \end{bmatrix} + \begin{bmatrix} 2 \\ 6 \\ 1 \end{bmatrix}$

Solution:  $\begin{bmatrix} 5 \\ 4 \\ 2 \end{bmatrix}$

(b)  $\begin{bmatrix} 6 \\ 8 \\ -1 \end{bmatrix} - \begin{bmatrix} 3 \\ 4 \end{bmatrix}$

Solution: Not defined

(c)  $\begin{bmatrix} 1 & 3 \\ 4 & -7 \end{bmatrix} - \begin{bmatrix} 6 & 0 \\ 1 & 2 \end{bmatrix}$

Solution:  $\begin{bmatrix} -5 & 3 \\ 3 & -9 \end{bmatrix}$

$$(d) \begin{bmatrix} 3 & 2 \\ 0 & 2 \end{bmatrix} \begin{bmatrix} 4 \\ -1 \end{bmatrix}$$

$$\text{Solution: } \begin{bmatrix} 10 \\ -2 \end{bmatrix}$$

$$(e) \begin{bmatrix} 3 & 2 \\ 0 & 2 \end{bmatrix} + \begin{bmatrix} 4 \\ -1 \end{bmatrix}$$

Solution: Not defined

$$(f) \begin{bmatrix} 3 \\ 0 \\ 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ -4 \\ 6 \end{bmatrix}$$

Solution: 12