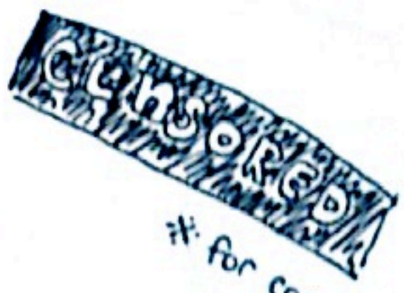
Linear Algebra for Multiplication



Example:

$$\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}\begin{pmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{pmatrix} =$$

What form do you think the answer will be in?

(a) Matrix
(b) Column
(c) Row
(d) Scalar
(e) None of the above

Work:

Hi! I'm dot product.
I'll be explaining Matrix multiplication to you.
There is no "Hide" option and ctl-alt-del won't work!

$$\begin{pmatrix} \boxed{1 \quad 2 \quad 3} \\ 4 \quad 5 \quad 6 \\ 7 \quad 8 \quad 9 \end{pmatrix}\begin{bmatrix} \boxed{1} & 4 & 7 \\ \boxed{2} & 5 & 8 \\ \boxed{3} & 6 & 9 \end{bmatrix}$$

To solve this problem, we need to look at it step-by-step! Let's multiply the first row in the first matrix by the first column in the second matrix.

$$1 \cdot 1 + 2 \cdot 2 + 3 \cdot 3 = 14$$

We multiply in a special way! We sum the product of each component to get our answer! The first component of the row is multiplied with the first component of the column, then we add this to the product of the second component and so on!

This answer represents the value of the answer in the first row first column position. If we repeat this again with the first row but second column, we will get a value in the first row, second column. The same will happen with the second row, first column!

Can you answer the question above?

What restrictions does this method have?

Is the answer going to be the same if we switch the matrix?

Do you think dot product helper looks edible?