Problem 1. (1 point)

Which of the following is our *definition* of the matrix product BA?

- A. The matrix whose ijth component is the dot product of the ith row of B and the jth column of A.
- B. The matrix AB.
- C. The matrix with columns $A\vec{v}_j$, where $\vec{v}_j$ are the columns of the matrix B.
- D. The matrix with columns $B\vec{v}_j$, where $\vec{v}_j$ are the columns of the matrix A.
- E. The matrix of the transformation $T(\vec{x}) = B(A\vec{x})$.
- F. The matrix whose ijth component is the dot product of the ith row of A and the jth column of B.
- G. The matrix whose ijth component is the product of the ijth components of the matrices B and A.

Answer(s) submitted:

- E

submitted: (correct)
recorded: (correct)

Problem 2. (1 point)

If the 3rd column of the matrix A is $\vec{v}_3 = \begin{bmatrix} 3 \\ 0 \\ -2 \end{bmatrix}$ and the matrix $B = \begin{bmatrix} 2 & 1 & 0 \\ -1 & 2 & 0 \\ 3 & 0 & 0 \end{bmatrix}$, fill in the following statement about the product BA:

Column number ___ of BA is $\begin{bmatrix} - \\ - \\ - \end{bmatrix}$.

Answer(s) submitted:

- 3
- $\begin{bmatrix} 6 \\ -3 \\ 9 \end{bmatrix}$

submitted: (correct)
recorded: (correct)

Problem 3. (1 point)

Consider the block matrices

$$A = \left[\begin{array}{cc|c} -1 & 3 & 0 \\ -3 & 3 & 1 \\ \hline 1 & 0 & -1 \end{array}\right] = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix}$$

and

$$B = \left[\begin{array}{cc|c} 1 & -3 & -2 \\ 0 & 1 & 1 \\ \hline 0 & 1 & 1 \end{array}\right] = \begin{bmatrix} B_{11} & B_{12} \\ B_{21} & B_{22} \end{bmatrix}.$$

By multiplying the blocks of these matrices, we obtain the block matrix product.

$$C = AB = \begin{bmatrix} C_{11} & C_{12} \\ C_{21} & C_{22} \end{bmatrix}.$$

What is C_{11}?

Answer: $C_{11} = \begin{bmatrix} - & - \\ - & - \end{bmatrix}$

Answer(s) submitted:

- $\begin{bmatrix} -1 & 6 \\ -3 & 13 \end{bmatrix}$

submitted: (correct)
recorded: (correct)