Linear Algebra Self-check test





Name: _____

Part 1: Dot Product

Calculate the dot product of the following vectors:

$$1. \begin{bmatrix} 2 \\ -1 \\ 3 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 4 \\ -2 \end{bmatrix} = \underline{\qquad}$$

Part 2: Vector-Matrix Multiplication

Multiply the vector with the matrix:

3.
$$\begin{bmatrix} 1 & -2 \\ 3 & 0 \\ -1 & 4 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \end{bmatrix} = \underline{\hspace{1cm}}$$

Part 3: Matrix-Matrix Multiplication

Multiply the matrices:

$$5. \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ -1 & 2 \end{bmatrix} = \underline{\hspace{1cm}}$$

6.
$$\begin{bmatrix} 2 & 1 & 0 \\ -1 & 0 & 3 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 0 & -1 \\ 3 & 0 \end{bmatrix} = \underline{\hspace{1cm}}$$

$$7. \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = \underline{\hspace{1cm}}$$

Part 4: Matrix Determinant (3 minutes)

Calculate the determinant:

$$8. \det \begin{pmatrix} 3 & 1 \\ 2 & 4 \end{pmatrix} = \underline{\qquad}$$

9.
$$\det \begin{pmatrix} 2 & -1 & 0 \\ 1 & 3 & 2 \\ 0 & 1 & -1 \end{pmatrix} = \underline{\hspace{1cm}}$$