

1. What is the product of matrices A and B, where $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$?
2. If matrix C is the product of matrices D and E, where $D = \begin{bmatrix} 2 & 5 \\ 7 & 4 \end{bmatrix}$ and $E = \begin{bmatrix} 9 & 6 \\ 7 & 8 \end{bmatrix}$, what is the value of C?
3. If matrix F is the product of matrices G and H, where $G = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ and $H = \begin{bmatrix} 7 & 8 \\ 9 & 10 \\ 11 & 12 \end{bmatrix}$, what is the dimension of matrix F?
4. What is the product of matrices I and J, where $I = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ and $J = \begin{bmatrix} 7 & 8 \\ 9 & 10 \\ 11 & 12 \end{bmatrix}$?
5. If matrix K is the product of matrices L and M, where $L = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $M = \begin{bmatrix} 5 & 6 & 7 & 8 \end{bmatrix}$, what is the value of K?
6. If matrix N is the product of matrices O and P, where $O = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ and $P = \begin{bmatrix} 7 & 8 & 9 \end{bmatrix}$, what is the dimension of matrix N?
7. What is the product of matrices Q and R, where $Q = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \end{bmatrix}$ and $R = \begin{bmatrix} 9 & 10 \\ 11 & 12 \\ 13 & 14 \\ 15 & 16 \end{bmatrix}$?
8. If matrix S is the product of matrices T and U, where $T = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ and $U = \begin{bmatrix} 10 & 11 \\ 12 & 13 \\ 14 & 15 \end{bmatrix}$, what is the value of S?