

Sample Problem 3

The purpose of these practice problems is to apply what the student has learned as well as to aid in retention. **This is not for a grade!** However, if the student completes all the sample problems, the student will be able to turn all sample problems in for extra credit worth 50 points at the end of the course.

1 Matrices and Vectors

Create two Matrices A for the left matrix and B for the right (refer to the figure on the slide). Multiply Matrices A and B to attain result. Now transpose the result. Add that result to $C = \text{transpose}([1 \ 1 \ 2; 2, 3, 4])$ and assign to D. Now take the dot product C and D and assign to E. Have the answer display only the first 3 components.

Recalling Matrix multiplication

$$\begin{pmatrix} 1 & 3 & 7 & 9 \\ 6 & 4 & 2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 2 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \\ 0 & 0 & 1 \end{pmatrix} = \begin{pmatrix} 8 & 12 & 24 \\ 8 & 18 & 11 \end{pmatrix}$$

Dimensions: 2×4 , 4×3 , 2×3

More generally, if A is $p \times q$, B is $q \times r$, then AB is a $p \times r$ matrix with:

$$(AB)_{ij} = \sum_{k=1}^q A_{ik} B_{kj}$$

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Note: See ExampleProgram4_Matrices.m