Problem 1. Consider the matrices

$$A = \begin{pmatrix} 4 & 2 & 3 \\ 2 & 3 & 2 \end{pmatrix}, \quad B = \begin{pmatrix} 1 & 2 \\ 1 & 2 \end{pmatrix}, \quad C = \begin{pmatrix} 2 & 4 & 4 \\ 3 & 1 & 3 \end{pmatrix}.$$

For each of the following, compute the matrix or indicate that the expression is undefined.

AB

BA

$A + 3BC$

$C^2 - 2I_2$