Math 205 Quiz 4
Name:

1. Let $A$ be an $m \times n$ matrix, $B$ be an $n \times p$ matrix, and $C$ be an $n \times m$ matrix where $n \neq m \neq p$.

   (a) Circle the matrix multiplications that can be computed.

   $AB$ $\quad$ $BC$ $\quad$ $CB$ $\quad$ $CA$ $\quad$ $AC$ $\quad$ $A^TB$ $\quad$ $A^TC$ $\quad$ $B^TC$

2. Consider the matrix $A = \begin{pmatrix} 1 & -2 & 0 \\ 0 & 4 & 0 \\ 0 & -4 & 1 \end{pmatrix}$.

   (a) Find the inverse of $A$.

   (b) Row reducing $A$ to the Identity can be done in three steps. Therefore there are three elementary matrices, $E_1, E_2$, and $E_3$ such that $E_3E_2E_1A = I$. Determine these matrices. Order matters. $E_1$ is the first row operation to be performed, etc.

   $E_1 =$

   $E_2 =$

   $E_3 =$

3. Consider the matrix $A = \begin{pmatrix} 4 & h \\ h & 1 \end{pmatrix}$.

   (a) For what value(s) of $h$ will $A^{-1}$ fail to exist?

   (b) Determine the inverse of the matrix $A$ when it exists.