Math 17B - UCD Name

No notes or calculators. You can leave an answer as a numerical expression without computing the final value. For example, this is a perfectly acceptable answer : $((250-63)/(1-e^{(-6*3.5)}))*ln(27/168)$. Show your work clearly !!

1. Let $A = \begin{bmatrix} -1 & 2 \\ 0 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 \\ 2 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & -2 & 0 & 3 \\ 1 & -1 & -1 & 0 \end{bmatrix}$.

   (i) (**4 pts**) Find the matrix $\frac{1}{2}A + 2B$.

$$\frac{1}{2}\begin{bmatrix} -1 & 2 \\ 0 & -3 \end{bmatrix} + 2\begin{bmatrix} 0 & 1 \\ 2 & 4 \end{bmatrix} = \begin{bmatrix} -1/2 & 1 \\ 0 & -3/2 \end{bmatrix} + \begin{bmatrix} 0 & 2 \\ 4 & 8 \end{bmatrix}$$

$$= \begin{bmatrix} -1/2 & 3 \\ 4 & 13/2 \end{bmatrix}$$

   (ii) (**5 pts**)Check that $(AC)' = C'A'$.

$$AC = \begin{bmatrix} -1 & 2 \\ 0 & -3 \end{bmatrix}\begin{bmatrix} 1 & -2 & 0 & 3 \\ 1 & -1 & -1 & 0 \end{bmatrix} = \begin{bmatrix} 1 & 0 & -2 & -3 \\ -3 & 3 & 3 & 0 \end{bmatrix}$$

$$(AC)' = \begin{bmatrix} 1 & -3 \\ 0 & 3 \\ -2 & 3 \\ -3 & 0 \end{bmatrix}$$

$$C'A' = \begin{bmatrix} 1 & 1 \\ -2 & -1 \\ 0 & -1 \\ 3 & 0 \end{bmatrix}\begin{bmatrix} -1 & 0 \\ 2 & -3 \end{bmatrix} = \begin{bmatrix} 1 & -3 \\ 0 & 3 \\ -2 & 3 \\ -3 & 0 \end{bmatrix}$$

2. (**1 pts**) If A is an $n \times p$ matrix and B is a $q \times n$ matrix and $p \neq q$. Which of the following products can be defined (Circle the right answer - no explanation is necessary) :
   (a) AB (b) BA