Quiz 7

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. (**1pt each**) Circle the right answer(s) in each of the following questions. More than one answer could be correct - you have to mark ALL the correct answers to get full credit.

   (i) A, B and C are $n \times n$ matrices. Then $A(BC) = (AB)C$ is :
   (a) Always true (b) Sometimes true, depends on A, B, C (c) Always false

   (ii) A and B are $n \times n$ matrices. Then $AB = BA$ is :
   (a) Always true (b) Sometimes true, depends on A, B (c) Always false

   (iii) A and B are $m \times p$ matrices, C is a $p \times n$. Then $(A+B)C = AC + BC$ is :
   (a) Always true (b) Sometimes true, depends on A, B, C (c) Always false

   (iv) 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 :
   (a) AB (b) BA

   (v) A is an $m \times p$ matrix and B is a $p \times n$ matrix. Which of the following products can be defined :
   (a) AB (b) $B'A'$ (recall that A' and B' denote the transpose matrices.)

2. (**5 pts**) Let $A = \begin{bmatrix} -1 & 2 \\ 0 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 \\ 2 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & -2 \\ 1 & -1 \end{bmatrix}$. Find a 2×2 matrix D such that

$$3D - A = 2(D - C) + 3B.$$

$3D - A = 2D - 2C + 3B$

$\rightarrow 3D - 2D = A - 2C + 3B$

$\rightarrow D = A - 2C + 3B$

$\rightarrow D = \begin{bmatrix} -1 & 2 \\ 0 & -3 \end{bmatrix} + 3\begin{bmatrix} 0 & 1 \\ 2 & 4 \end{bmatrix} - 2\begin{bmatrix} 1 & -2 \\ 1 & -1 \end{bmatrix}$

$= \begin{bmatrix} -3 & 9 \\ 4 & 12 \end{bmatrix}$