WebAssign
CH 1.3 (Homework)

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MA 265 Spring 2013, section 132, Spring 2013
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Current Score : 20 / 20 **Due :** Thursday, January 17 2013 11:40 PM EST

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1. 2.85/2.85 points | Previous Answers KolmanLinAlg9 1.3.012.

Consider the following matrices.

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 1 & 4 \end{bmatrix}, \qquad B = \begin{bmatrix} 1 & 0 \\ 2 & 1 \\ 3 & 2 \end{bmatrix},$$

$$C = \begin{bmatrix} 3 & -1 & 3 \\ 4 & 1 & 5 \\ 2 & 1 & 3 \end{bmatrix}, \qquad D = \begin{bmatrix} 3 & -2 \\ 2 & 5 \end{bmatrix},$$

$$E = \begin{bmatrix} 1 & -4 & 5 \\ 0 & 5 & 4 \\ 3 & 2 & 2 \end{bmatrix}, \text{ and } F = \begin{bmatrix} -1 & 2 \\ 0 & 4 \\ 3 & 5 \end{bmatrix}.$$

If possible, compute the following. (If not possible, enter DNE into any cell of the matrix.)

(a) $DA + B$

	DNE	

(b) EC

-3	0	-2
28	9	37
21	1	25

(c) CE

12	-11	17
19	-1	34
11	3	20

(d) $EB + F$

7	8	
22	17	
16	11	

(e) $FC + D$

DNE		

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2. 2.85/2.85 points | Previous Answers KolmanLinAlg9 1.3.014.

Consider the following matrices.

$$A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & 5 \end{bmatrix}, \qquad B = \begin{bmatrix} 1 & 0 \\ 2 & 1 \\ 3 & 2 \end{bmatrix},$$

$$C = \begin{bmatrix} 3 & -1 & 3 \\ 4 & 1 & 5 \\ 2 & 1 & 3 \end{bmatrix}, \qquad D = \begin{bmatrix} 3 & -2 \\ 2 & 5 \end{bmatrix},$$

$$E = \begin{bmatrix} 2 & -4 & 5 \\ 0 & 1 & 4 \\ 3 & 2 & 1 \end{bmatrix}, \text{ and } F = \begin{bmatrix} -1 & 2 \\ 0 & 4 \\ 3 & 5 \end{bmatrix}.$$

If possible, compute the following. (If not possible, enter DNE into any cell of the matrix.)

(a) $A(BD)$

32	4	
79	17	

(b) $(AB)D$

32	4	
79	17	

(c) $A(C + E)$

18	2	30
39	7	45

(d) $AC + AE$

18	2	30
39	7	45

(e) $(2AB)^T$ and $2(AB)^T$

$(2AB)^T =$

16	38	
8	22	

$2(AB)^T =$

16	38	
8	22	

(f) $A(C - 3E)$

-2	2	-26
-37	-5	-31

3. 2.85/2.85 points | Previous Answers KolmanLinAlg9 1.3.016.

Let $A = [1 \;\; 2 \;\; -4]$, $B = [-1 \;\; 5 \;\; 2]$, and $C = [-2 \;\; 0 \;\; 1]$. If possible, compute the following. (If not possible, enter DNE into any cell of the matrix.)

(a) AB^T

1		

(b) CA^T

-6		

(c) $(BA^T)C$

-2	0	1

(d) A^TB

-1	5	2
-2	10	4
4	-20	-8

(e) CC^T

5		

(f) C^TC

4	0	-2
0	0	0
-2	0	1

(g) B^TCAA^T

DNE		

4. 2.85/2.85 points | Previous Answers KolmanLinAlg9 1.3.018.

If $I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $D = \begin{bmatrix} 3 & 2 \\ -2 & -3 \end{bmatrix}$, compute DI_2 and I_2D.

$DI_2 = \begin{bmatrix} 3 & 2 \\ -2 & -3 \end{bmatrix}$

$I_2D = \begin{bmatrix} 3 & 2 \\ -2 & -3 \end{bmatrix}$

5. 2.85/2.85 points | Previous Answers KolmanLinAlg9 1.3.019.

Let

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 2 & -1 \\ -2 & 4 \end{bmatrix}.$$

Show that $AB \neq BA$.

$AB = \begin{bmatrix} -2 & 7 \\ 2 & 5 \end{bmatrix}$

$BA = \begin{bmatrix} -1 & 2 \\ 10 & 4 \end{bmatrix}$

Does $AB = BA$?

- ○ Yes
- ◉ No

6. 2.85/2.85 points | Previous Answers KolmanLinAlg9 1.3.026.

(a) Find a value of r so that $AB^T = 0$, where $A = [r \;\; 1 \;\; -2]$ and $B = [1 \;\; 4 \;\; -1]$.

$r =$ -6

(b) Give an alternative way to write this product.

- ○ B^TA
- ○ BA
- ○ A^TB
- ○ A^TB^T
- ◉ BA^T

7. 2.9/2.9 points | Previous Answers KolmanLinAlg9 1.3.030.

Consider the following linear system:

$$\begin{aligned} 2x_1 + 2x_2 - 3x_3 + x_4 + x_5 &= 7 \\ 3x_1 + 3x_3 + 3x_5 &= -2 \\ 2x_1 + 3x_2 - 3x_4 &= 3 \\ x_3 + x_4 + x_5 &= 5. \end{aligned}$$

(a) Find the coefficient matrix.

2	2	-3	1	1
3	0	3	0	3
2	3	0	-3	0
0	0	1	1	1

(b) Write the linear system in matrix form.

$$\begin{bmatrix} 2 & 2 & -3 & 1 & 1 \\ 3 & 0 & 3 & 0 & 3 \\ 2 & 3 & 0 & -3 & 0 \\ 0 & 0 & 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \end{bmatrix} = \begin{bmatrix} 7 \\ -2 \\ 3 \\ 5 \end{bmatrix}$$

(c) Find the augmented matrix.

$$\left[\begin{array}{ccccc|c} 2 & 2 & -3 & 1 & 1 & 7 \\ 3 & 0 & 3 & 0 & 3 & -2 \\ 2 & 3 & 0 & -3 & 0 & 3 \\ 0 & 0 & 1 & 1 & 1 & 5 \end{array}\right]$$