WebAssign CH 1.3 (Homework) Yinglai Wang MA 265 Spring 2013, section 132, Spring 2013 Instructor: Alexandre Eremenko

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) <i>DA</i> + <i>B</i>			
	DNE		
			-
			\Rightarrow
11			
*			
(b) EC		,	
-3	0	-2	—
28	9	37	\Rightarrow
21	1	25	
1 1	1	1	
✓			
(c) <i>CE</i>			
12	-11	17	_
19	-1	34	-
11	3	20	•
1 1	D	5	
✓			
(d) <i>EB</i> + <i>F</i>			
7	8		—
22	17		· ⇒
16	11		
11			
✓			
(e) $FC + D$			
DNE			_
			\Rightarrow
1 1			
11			

2. 2.85/2.85 points | Previous Answers

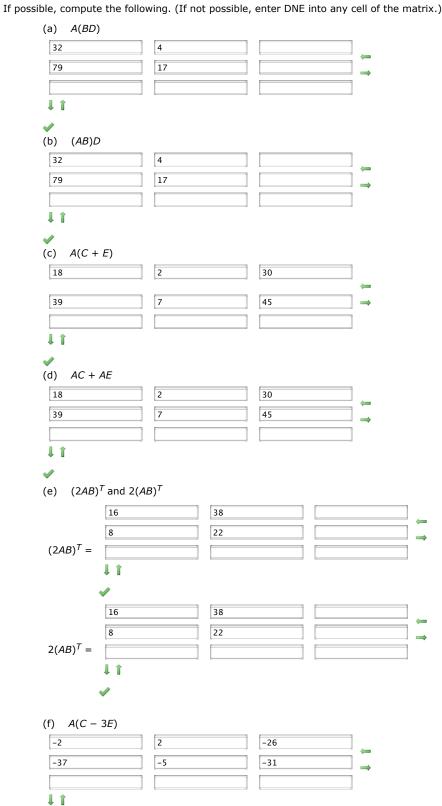
KolmanLinAlg9 1.3.014.

Consider the following matrices.

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

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

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



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3. 2.85/2.85 points | Previous Answers

KolmanLinAlg9 1.3.016.

(a) <i>AB</i> ^T		
1		
		→
5		4
11		
√ (b) <i>CA^T</i>		
-6		
-6		←
		⇒
11		
√		
(c) (<i>BA</i> ^T) <i>C</i>		
-2	0	1
		<u>-</u>
		→
11		
√ .		
(d) A^TB		
-1	5	2
-2	10	4
4	-20	-8
11		
✓.		
(e) CC^T		
5		
		
		→
1 1		
+ 1		
√		
(f) <i>C^TC</i>		
4	0	-2
0	0	0 🔿
-2	0	1
11	d 5d	b————d
(g) B^TCAA^T		
DNE		
		←
		<i>→</i>
11		

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 .

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

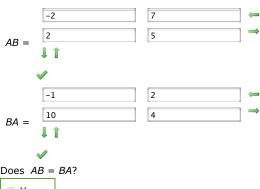
5. 2.85/2.85 points | Previous Answers

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 $AB \neq BA$.



Does AB = BA?



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 $B = [1 \ 4 \ -1]$.
- (b) Give an alternative way to write this product.
- $\bigcirc B^T A$ \bigcirc BA $\bigcirc A^TB$ $\bigcirc A^TB^T$ \odot BA^T

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7. 2.9/2.9 points | Previous Answers

KolmanLinAlg9 1.3.030.

Consider the following linear system:

$$2x_1 + 2x_2 - 3x_3 + x_4 + x_5 = 7$$

 $3x_1 + 3x_3 + 3x_5 = -2$
 $2x_1 + 3x_2 - 3x_4 = 3$
 $x_3 + x_4 + x_5 = 5$.

(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.

2	2	-3	1	1	[x ₁]	7
3	0	3	0	3	$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$	-2
2	3	0	-3	0	$\begin{vmatrix} x_3 \\ x_4 \end{vmatrix} =$	3
0	0	1	1	1	X4 X5	5
✓.					١٠١	/ ·

(c) Find the augmented matrix.

