Web**Assign**CH B.2 (Homework)

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**Current Score :** 20 / 20 **Due :** Thursday, April 18 2013 11:40 PM EDT

**The due date for this assignment is past.** Your work can be viewed below, but no changes can be made.

**Important!** Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

Request Extension View Key

1. 4/4 points | Previous Answers

KolmanLinAlg9 B.2.001.

Solve by using Gauss-Jordan reduction. (If there is no solution, enter NO SOLUTION.)

(a) 
$$(1+2i)x_1 + (-2+i)x_2 = 3-9i$$
  
 $(2+i)x_1 + (-1+2i)x_2 = -3-3i$ 

$$(x_1,x_2)=\Big(\qquad \qquad \Big)$$

(b) 
$$2ix_1 - (1-i)x_2 = 5 + 5i$$
  
 $(1-i)x_1 + x_2 = 5 - 5i$ 

$$(x_1, x_2) = \left( \begin{array}{c} \\ \end{array} \right)$$

(c) 
$$(1+i)x_1 - x_2 = -1$$
  
 $2ix_1 + (1-i)x_2 = i$ 

$$(x_1, x_2) = \left( \right.$$

2. 4/4 points | Previous Answers

KolmanLinAlg9 B.2.003.

Solve by Gaussian elimination with back substitution.

(a) 
$$ix_1 + (1+i)x_2 = 1$$
  
 $(1-i)x_1 + x_2 - ix_3 = 1$   
 $ix_2 + x_3 = 1 + 2i$ 

$$(x_1, x_2, x_3) = ($$

(b) 
$$3x_1 + ix_2 + (1-i)x_3 = 2 + i$$
  
 $ix_1 + (4+i)x_3 = -1 + 4i$   
 $5ix_2 - x_3 = 5 - i$ 

$$(x_1, x_2, x_3) = ($$

## **3.** 4/4 points | Previous Answers

KolmanLinAlg9 B.2.004.

Compute the determinant and simplify as much as possible.

(a) 
$$\begin{vmatrix} 1+i & -1 \\ 4i & 1+i \end{vmatrix}$$

 $\checkmark$ 

(b) 
$$\begin{vmatrix} 5-i & 1+i \\ 1+5i & -(1-i) \end{vmatrix}$$

1

(c) 
$$\begin{vmatrix} 4+i & 3 & 5-i \\ i & 0 & 5+i \\ -3 & 4 & 1+3i \end{vmatrix}$$

**4** 

(d) 
$$\begin{vmatrix} 3 & 1-i & 0 \\ 1+i & -1 & i \\ 0 & -i & 3 \end{vmatrix}$$

## 4. 4/4 points | Previous Answers

KolmanLinAlg9 B.2.005.

Find the inverse of each of the following matrices, if possible. (If there is no solution, enter NONE in any single cell.)

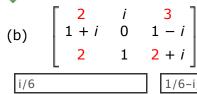
(a) 
$$\begin{bmatrix} i & 4 \\ 1+i & -i \end{bmatrix}$$

$$4/25+3i/25$$

$$7/25-i/25$$

$$-4/25-3i/25$$

$$2 \qquad i \qquad 3$$



i/6	1/6-i/2	1/6
-1/3-i/2	i/3	1/2+i/3
1/6	i/3	-i/6

<b>5.</b> 4/4 points	Previous Answers

KolmanLinAlg9 B.2.011.

Find the eigenvalues and associated eigenvectors of the following complex matrices. (Consider "c - i" to be a smaller value than "c + i," assuming c is a positive real number.)

(a) 
$$A = \begin{bmatrix} 4 & 1 \\ -1 & 4 \end{bmatrix}$$

$$\mathbf{x}_1 = \begin{bmatrix} \mathbf{i} \\ \mathbf{1} \\ \mathbf{-i} \end{bmatrix} \qquad \text{(smaller $\lambda$-value)}$$

$$\lambda_2 = 1$$
 (larger  $\lambda$ -value)

(b) 
$$A = \begin{bmatrix} 3 & i \\ -i & 3 \end{bmatrix}$$

$$\lambda_1 = \begin{bmatrix} -i \\ 1 \end{bmatrix}$$
 (smaller  $\lambda$ -value)

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$$\mathbf{x}_2 = \boxed{1}$$
 (larger  $\lambda$ -value)  $\lambda_2 = \checkmark$ 

(c) 
$$A = \begin{bmatrix} 5 & 0 & 0 \\ 0 & 5 & i \\ 0 & -i & 5 \end{bmatrix}$$

$$\mathbf{x}_1 = \begin{bmatrix} 0 \\ -\mathrm{i} \\ 1 \end{bmatrix} \qquad \text{(smallest $\lambda$-value)}$$
 
$$\mathbf{x}_2 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$
 
$$\mathbf{x}_2 = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$\lambda_3 = \begin{bmatrix}
i \\
1
\end{bmatrix}$$
 (largest  $\lambda$ -value)