Web**Assign**
CH 4.6 - 2 (Homework)

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MA 265 Spring 2013, section 132, Spring 2013
Instructor: Alexandre Eremenko

Current Score : 20 / 20   **Due :** Thursday, March 7 2013 11:40 PM EST

> **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

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1. 2.5/2.5 points | Previous Answers   KolmanLinAlg9 4.6.014.

Let

$$S = \left\{ \begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}, \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} 2 & 2 \\ 2 & 2 \end{bmatrix}, \begin{bmatrix} -1 & 5 \\ 5 & -1 \end{bmatrix} \right\}.$$

Find a basis for the subspace W = span S of M_{22}.

○ $\left\{ \begin{bmatrix} 5 & 2 \\ 2 & 5 \end{bmatrix} \right\}$

○ $\left\{ \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \right\}$

○ $\left\{ \begin{bmatrix} 2 & 5 \\ 5 & 2 \end{bmatrix} \right\}$

○ $\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \right\}$

◉ $\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \right\}$ ✔

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2. 2.5/2.5 points | Previous Answers   KolmanLinAlg9 4.6.015.

Find all values of a for which

$$\left\{ \begin{bmatrix} a^2 & 0 & 1 \end{bmatrix}, \begin{bmatrix} 0 & a & 7 \end{bmatrix}, \begin{bmatrix} 1 & 0 & 1 \end{bmatrix} \right\}$$

is not a basis for R_3. (Enter your answers as a comma-separated list.)

a =   ✔

3. 2.5/2.5 points | [Previous Answers](#)   KolmanLinAlg9 4.6.016.

Find a basis for the subspace W of M_{33} consisting of all symmetric matrices.

$\bigcirc \left\{ \begin{bmatrix} 5&0&0\\0&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&3\\0&0&0\\3&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&4&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&0\\0&0&1 \end{bmatrix} \right\}$

$\bigcirc \left\{ \begin{bmatrix} 5&0&0\\0&5&0\\0&0&5 \end{bmatrix}, \begin{bmatrix} 0&3&0\\3&0&3\\0&3&0 \end{bmatrix}, \begin{bmatrix} 0&0&4\\4&4&4\\4&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&1&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&2\\0&2&0 \end{bmatrix}, \begin{bmatrix} 0&0&6\\0&6&0\\6&0&0 \end{bmatrix} \right\}$

$\bigcirc \left\{ \begin{bmatrix} 5&0&0\\0&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&3&0\\3&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&4&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&1\\0&1&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&0\\0&0&2 \end{bmatrix} \right\}$

$\bigcirc \left\{ \begin{bmatrix} 5&0&0\\0&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&3&0\\3&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&4\\0&4&0\\4&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&1\\0&1&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&0\\0&0&2 \end{bmatrix} \right\}$

$\odot \left\{ \begin{bmatrix} 5&0&0\\0&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&3&0\\3&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&4\\0&0&0\\4&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&1&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&2\\0&2&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&0\\0&0&6 \end{bmatrix} \right\}$ ✔

4. 2.5/2.5 points | Previous Answers   KolmanLinAlg9 4.6.017.

Find a basis for the subspace of M_{33} consisting of all diagonal matrices.

$\bigcirc \left\{ \begin{bmatrix} 2&0&0\\0&4&0\\0&0&5 \end{bmatrix}, \begin{bmatrix} 0&2&0\\0&4&0\\0&5&0 \end{bmatrix}, \begin{bmatrix} 0&0&2\\0&4&0\\5&0&0 \end{bmatrix} \right\}$

$\odot \left\{ \begin{bmatrix} 2&0&0\\0&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&4&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&0\\0&0&5 \end{bmatrix} \right\}$

$\bigcirc \left\{ \begin{bmatrix} 2&2&2\\0&0&0\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\4&4&4\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&0\\0&0&0\\5&5&5 \end{bmatrix} \right\}$

$\bigcirc \left\{ \begin{bmatrix} 2&0&0\\0&4&0\\0&0&5 \end{bmatrix}, \begin{bmatrix} 0&0&0\\4&4&4\\0&0&0 \end{bmatrix}, \begin{bmatrix} 0&0&2\\0&4&0\\5&0&0 \end{bmatrix} \right\}$

$\bigcirc \left\{ \begin{bmatrix} 2&0&0\\4&0&0\\5&0&0 \end{bmatrix}, \begin{bmatrix} 0&2&0\\0&4&0\\0&5&0 \end{bmatrix}, \begin{bmatrix} 0&0&2\\0&0&4\\0&0&5 \end{bmatrix} \right\}$ ✔

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5. 2.5/2.5 points | Previous Answers   KolmanLinAlg9 4.6.023.

Find the dimensions of the given subspaces of R_4.

(a) All vectors of the form $\begin{bmatrix} a & b & c & d \end{bmatrix}$, where $d = b + c$.

$\boxed{3}$ ✔

(b) All vectors of the form $\begin{bmatrix} a & b & c & d \end{bmatrix}$, where $b = a - c$ and $d = a + c$.

$\boxed{2}$ ✔

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6. 2.5/2.5 points | Previous Answers   KolmanLinAlg9 4.6.024.

Find the dimensions of the given subspaces of R_4.

(a) All vectors of the form $\begin{bmatrix} a & b & c & d \end{bmatrix}$, where $c = d$.

$\boxed{3}$ ✔

(b) All vectors of the form $\begin{bmatrix} b + c & b - a & a + c & -b + a \end{bmatrix}$.

$\boxed{2}$ ✔

7. 2.5/2.5 points | Previous Answers

Find a basis for the given subspaces of R^3.

(a) All vectors of the form $\begin{bmatrix} a \\ b \\ c \end{bmatrix}$, where $c = a + b$

1	0
0	1
1	1

✔

(b) All vectors of the form $\begin{bmatrix} a \\ b \\ c \end{bmatrix}$, where $a = c$

0	1
1	0
0	1

✔

(c) All vectors of the form $\begin{bmatrix} a \\ b \\ c \end{bmatrix}$, where $4a + b - c = 0$

1	0
0	1
4	1

✔

8. 2.5/2.5 points | Previous Answers

KolmanLinAlg9 4.6.020.

Find a basis for the given subspaces of R^3 or R^4.

(a) All vectors of the form $\begin{bmatrix} a \\ b \\ c \end{bmatrix}$, where $a = 0$

0	0
1	0
0	1

✔

(b) All vectors of the form $\begin{bmatrix} a + c \\ a - b \\ b + c \\ -a + b \end{bmatrix}$

1	0
1	-1
0	1
-1	1

✔

(c) All vectors of the form $\begin{bmatrix} a \\ b \\ c \end{bmatrix}$, where $a - b + 3c = 0$

1	0
1	3
0	1

✔