WebAssign
CH 4.3 - 2 (Homework)

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MA 265 Spring 2013, section 132, Spring 2013
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Current Score : 18 / 20 **Due :** Thursday, February 14 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

1. 4/4 points | Previous Answers KolmanLinAlg9 4.3.016.

Which of the given subsets of the vector space P_2 are subspaces?

(a) $a_2t^2 + a_1t + a_0$, where $a_1 = 0$ and $a_0 = 0$

- (•) subspace
- ( ) not a subspace

✓

(b) $a_2t^2 + a_1t + a_0$, where $a_1 = 7a_0$

- (•) subspace
- ( ) not a subspace

✓

(c) $a_2t^2 + a_1t + a_0$, where $a_2 + a_1 + a_0 = 6$

- ( ) subspace
- (•) not a subspace

✓

2. 4/4 points | Previous Answers KolmanLinAlg9 4.3.017.

Which of the following subsets of the vector space M_{nn} are subspaces?

(a) The set of all $n \times n$ symmetric matrices

- (•) subspace
- ( ) not a subspace

(b) The set of all $n \times n$ diagonal matrices

- (•) subspace
- ( ) not a subspace

(c) The set of all $n \times n$ nonsingular matrices

- ( ) subspace
- (•) not a subspace

3. 4/4 points | Previous Answers KolmanLinAlg9 4.3.019.

Consider the vector space defined in Example 7 from Section 4.2:

> Let V be the set of all real-valued continuous functions defined on R^1. If f and g are in V, we define $f \oplus g$ by $(f \oplus g)(t) = f(t) + g(t)$. If f is in V and c is a scalar, we define $c \odot f$ by $(c \odot f)(t) = cf(t)$. Then V is a vector space, which is denoted by $C(-\infty, \infty)$.

Which of the following subsets are subspaces of the vector space $C(-\infty, \infty)$? (*Note*: Calculus is required to complete this exercise.)

(a) All nonnegative functions

- ○ subspace
- ◉ not a subspace ✔

(b) All constant functions

- ◉ subspace ✔
- ○ not a subspace

(c) All functions f such that $f(0) = 0$

- ◉ subspace ✔
- ○ not a subspace

(d) All functions f such that $f(0) = 10$

- ○ subspace
- ◉ not a subspace ✔

(e) All differentiable functions

- ◉ subspace ✔
- ○ not a subspace

4. 3/4 points | Previous Answers KolmanLinAlg9 4.3.033.

Which of the following vectors in R^3 are linear combinations of

$$\mathbf{v}_1 = \begin{bmatrix} 4 \\ 2 \\ -3 \end{bmatrix}, \quad \mathbf{v}_2 = \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix}, \text{ and } \mathbf{v}_3 = \begin{bmatrix} -2 \\ -1 \\ 0 \end{bmatrix}?$$

(a) $\begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$

- ○ linear combination
- ◉ not a linear combination ✓

(b) $\begin{bmatrix} 4 \\ 2 \\ -6 \end{bmatrix}$

- ◉ linear combination ✓
- ○ not a linear combination

(c) $\begin{bmatrix} -2 \\ -1 \\ 1 \end{bmatrix}$

- ○ linear combination
- ◉ not a linear combination ✗

(d) $\begin{bmatrix} -1 \\ -1 \\ 3 \end{bmatrix}$

- ○ linear combination
- ◉ not a linear combination ✓

5. 3/4 points | Previous Answers KolmanLinAlg9 4.3.034.

Which of the following vectors in R_4 are linear combinations of

$$\boldsymbol{v}_1 = \begin{bmatrix} 1 & 2 & 1 & 0 \end{bmatrix}, \quad \boldsymbol{v}_2 = \begin{bmatrix} 4 & 1 & -2 & 3 \end{bmatrix},$$
$$\boldsymbol{v}_3 = \begin{bmatrix} 1 & 2 & 6 & -5 \end{bmatrix}, \quad \boldsymbol{v}_4 = \begin{bmatrix} -2 & 3 & -1 & 2 \end{bmatrix}?$$

(a) $\begin{bmatrix} 4 & 8 & 4 & 0 \end{bmatrix}$

- (•) linear combination
- ( ) not a linear combination

✓

(b) $\begin{bmatrix} 1 & 0 & 0 & 0 \end{bmatrix}$

- ( ) linear combination
- (•) not a linear combination

✓

(c) $\begin{bmatrix} 6 & 5 & 5 & -2 \end{bmatrix}$

- ( ) linear combination
- (•) not a linear combination

✗

(d) $\begin{bmatrix} 0 & 0 & 0 & 1 \end{bmatrix}$

- ( ) linear combination
- (•) not a linear combination

✓