

WebAssign
CH 5.3 (Homework)Yinglai Wang
MA 265 Spring 2013, section 132, Spring 2013
Instructor: Alexandre Eremenko**Current Score :** 20 / 20 **Due :** Thursday, March 21 2013 11:40 PM EDT1. 5/5 points | [Previous Answers](#)

KolmanLinAlg9 5.3.008.

Let V be the Euclidean space R_4 with the standard inner product. Compute (\mathbf{u}, \mathbf{v}) .

(a) $\mathbf{u} = \begin{bmatrix} 1 & 4 & -1 & 3 \end{bmatrix}, \mathbf{v} = \begin{bmatrix} -1 & 4 & 0 & 1 \end{bmatrix}$
 ✓

(b) $\mathbf{u} = \begin{bmatrix} 0 & 0 & 3 & 3 \end{bmatrix}, \mathbf{v} = \begin{bmatrix} 3 & 3 & 0 & 0 \end{bmatrix}$
 ✓

(c) $\mathbf{u} = \begin{bmatrix} -2 & 1 & 3 & 5 \end{bmatrix}, \mathbf{v} = \begin{bmatrix} 4 & 2 & 1 & -2 \end{bmatrix}$
 ✓

2. 5/5 points | [Previous Answers](#)

KolmanLinAlg9 5.3.029.

Which of the given sets of vectors in R^3 , with the standard inner product, are orthogonal, orthonormal, or neither? (Choose the option that best describes the set.)

(a) $\left\{ \begin{bmatrix} \frac{1}{\sqrt{2}} \\ 0 \\ \frac{1}{\sqrt{2}} \end{bmatrix}, \begin{bmatrix} -\frac{1}{\sqrt{2}} \\ 0 \\ \frac{1}{\sqrt{2}} \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} \right\}$

- ☐ orthogonal
- ☒ orthonormal
- ☐ neither



(b) $\left\{ \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} \right\}$

- ☐ orthogonal
- ☐ orthonormal
- ☒ neither



(c) $\left\{ \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ -1 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \right\}$

- ☐ orthogonal
- ☐ orthonormal
- ☒ neither



3. 5/5 points | [Previous Answers](#)

KolmanLinAlg9 5.3.033.

Let V be the Euclidean space R^3 with the standard inner product.

Let $\mathbf{u} = \begin{bmatrix} 1 \\ 1 \\ -9 \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} a \\ -1 \\ 9 \end{bmatrix}$. For what values of a are \mathbf{u} and \mathbf{v} orthogonal? (Enter your answers as a comma-separated list.)

$a =$

4. 5/5 points | [Previous Answers](#)

KolmanLinAlg9 5.3.034.

Let V be the Euclidean space R^3 with the standard inner product.

Let $\mathbf{u} = \begin{bmatrix} \frac{1}{\sqrt{2}} \\ 0 \\ -\frac{1}{\sqrt{2}} \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} a \\ 1 \\ -b \end{bmatrix}$. For what values of a and b is $\{\mathbf{u}, \mathbf{v}\}$ an orthonormal set?

$a =$

$b =$