

Math 2210Q-004 Applied Linear Algebra
E-Mail Assignments
on the readings in the textbook

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Submit by E-Mail by 7:00 am on the date due (before class)
to dgross@math.uconn.edu.

Due for Thursday, April 23

Section 6.1 Inner Product, Length and Orthogonality

Section 6.2 Orthogonal Sets

To read: Read sections 6.1 and 6.2

To Do: Homework from sections 5.3 and 5.4

Be sure sure to understand: The definitions of inner product, norm and orthogonal complement; The statement of theorem 5 in section 6.2, and Figure 4 on page 388. This should mostly be a review of concepts already covered in Math 210.

Questions:

1. Are the two vectors $\vec{u} = \begin{bmatrix} 3 \\ 1 \end{bmatrix}$ and $\vec{v} = \begin{bmatrix} -2 \\ 3 \end{bmatrix}$ in \mathbb{R}^2 orthogonal? Why or why not?
 2. Let W be the xz -plane in \mathbb{R}^3 . What is the orthogonal complement of W ?
 3. Let $\vec{u}_1 = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ and $\vec{u}_2 = \begin{bmatrix} 1 \\ 1 \\ -2 \end{bmatrix}$. Then $\mathcal{B} = \{\vec{u}_1, \vec{u}_2, \}$ is an orthogonal basis for a 2-dimensional subspace W of \mathbb{R}^3 . (You should verify this for yourself.) The vector $\vec{y} = \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$ is in W . Express \vec{y} as a linear combination of \vec{u}_1 and \vec{u}_2 .
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