

Math 60
Homework 6

Name _____
Due Wednesday October 26 before 4:00 PM

1. Let $\langle (x_1, x_2), (y_1, y_2) \rangle = x_1x_2 + y_1y_2$. Is \langle, \rangle an inner product? Explain.
- 2 Let $\langle (x_1, x_2), (y_1, y_2) \rangle = x_1y_1 - x_2y_2$. Is \langle, \rangle an inner product? Explain.
3. Using the inner product $\langle (x_1, x_2, x_3, x_4), (y_1, y_2, y_3, y_4) \rangle = 2x_1y_1 + 3x_2y_2 + x_3y_3 + x_4y_4$, find the distance and angle between the vectors $(1, 1, 0, 1)$ and $(0, -1, -1, 2)$ in \mathbb{R}^4 .
4. Suppose $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is an orthogonal matrix with respect to the standard basis. What can you say about a, b, c and d ? (Hint: What does the fact that $A^T A = I$ say about a, b, c and d ?)