

Math 206 Group Quiz 5

Names: _____

1. a. Let \mathbf{u} and \mathbf{v} be vectors in \mathbb{R}^n and let $\mathbf{w} = \mathbf{u} - \frac{\mathbf{u} \cdot \mathbf{v}}{\mathbf{v} \cdot \mathbf{v}}\mathbf{v}$. Fully expand $\|\mathbf{w}\|^2$ in terms of \mathbf{u} and \mathbf{v} .

- b. Use the previous part of this problem to explain why $|\mathbf{u} \cdot \mathbf{v}| \leq \|\mathbf{u}\| \|\mathbf{v}\|$.

c. Use the previous parts of this problem to explain why $\|\mathbf{u} + \mathbf{v}\|^2 \leq (\|\mathbf{u}\| + \|\mathbf{v}\|)^2$.

2. Find the best constant function $f(x) = c$ to fit the data $\{(x_1, y_1), \dots, (x_n, y_n)\}$.