

QUIZ #12, 10/4/07

MATH 54, FALL 2007

Show your work and justify your answers! Feel free to use both sides.

Name:

1. (a) (3 pts) Project the vector $\mathbf{w} = \begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}$ onto the line spanned by $\mathbf{v} = \begin{bmatrix} 2 \\ 2 \\ 0 \end{bmatrix}$.

(b) (3 pts) Find the angle between \mathbf{v} and \mathbf{w} (you may leave a \cos^{-1} in your answer). Is the angle acute, right, or obtuse?

2. (4 pts) Find a vector orthogonal to $\begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix}$, $\begin{bmatrix} -2 \\ 1 \\ 1 \\ 0 \end{bmatrix}$, and $\begin{bmatrix} 1 \\ 2 \\ 0 \\ -3 \end{bmatrix}$. (Hint: If you get stuck, remember that you know how to solve systems of linear equations.)