

Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Given the vectors $\vec{u} = \begin{bmatrix} 1 \\ 3 \\ -4 \end{bmatrix}$, $\vec{v} = \begin{bmatrix} 2 \\ -5 \\ 1 \end{bmatrix}$ find the following.

a. $\mathbf{u} \cdot \mathbf{v}$

b. The distance between \mathbf{u} and \mathbf{v} .

c. A unit vector in the direction of \mathbf{v} .

d. Are \mathbf{u} and \mathbf{v} orthogonal? Why or why not?