MATH 54 SUMMER 2017, QUIZ 19

$$\mathbf{u} = \begin{bmatrix} 3 \\ 2 \\ 1 \\ 2 \end{bmatrix} \qquad \mathbf{v} = \begin{bmatrix} 1 \\ 0 \\ -1 \\ 2 \end{bmatrix} \qquad \mathbf{w} = \begin{bmatrix} 5 \\ 1 \\ -1 \\ -8 \end{bmatrix}$$

(a) Find the length of $\mathbf{u}$.

(b) Find the distance between $\mathbf{u}$ and $\mathbf{v}$—i.e. find $\mathrm{dist}(\mathbf{u}, \mathbf{v})$.

(c) Find the cosine of the angle between $\mathbf{u}$ and $\mathbf{v}$.

(d) Find a unit vector in the same direction as $\mathbf{u}$.

(e) Is any pair of the three vectors above orthogonal to each other?