

For each of the pairs of vectors below answer the following:

- a) Find the angle between \mathbf{u} and \mathbf{v}
 - b) Determine if \mathbf{u} and \mathbf{v} are orthogonal
 - c) Find $\text{proj}_{\mathbf{v}}\mathbf{u}$, the projection of \mathbf{u} onto \mathbf{v}
 - d) Decompose \mathbf{u} as the sum of vector parallel and orthogonal to \mathbf{v}
1. $\mathbf{u} = \langle 4, 2 \rangle$ and $\mathbf{v} = \langle -1, -1 \rangle$
 2. $\mathbf{u} = \langle 1, 5 \rangle$ and $\mathbf{v} = \langle 10, -2 \rangle$
 3. $\mathbf{u} = \langle 3, 7 \rangle$ and $\mathbf{v} = \langle 4, 5 \rangle$