Exercise 7

In Exercises 6 to 11, compute $\|\mathbf{u}\|$, $\|\mathbf{v}\|$, *and* $\mathbf{u} \cdot \mathbf{v}$ *for the given vectors in* $\mathbb{R}^3$.

$$\mathbf{u} = 2\mathbf{j} - \mathbf{i}, \ \mathbf{v} = -\mathbf{j} + \mathbf{i}$$

Solution

$$\|\mathbf{u}\| = \sqrt{2^2 + (-1)^2} = \sqrt{5} \approx 2.24$$

$$\|\mathbf{v}\| = \sqrt{(-1)^2 + 1^2} = \sqrt{2} \approx 1.41$$

$$\mathbf{u} \cdot \mathbf{v} = (2\mathbf{j} - \mathbf{i}) \cdot (-\mathbf{j} + \mathbf{i}) = (2)(-1) + (-1)(1) = -3$$