9.1 & 9.2 Recitation Exercises

1. Let $\boldsymbol{u}$ and $\boldsymbol{v}$ be two orthogonal defined as $\boldsymbol{u} = k\,\boldsymbol{i} + 3\boldsymbol{j} - 2\,\boldsymbol{i}$, and $\boldsymbol{v} = \langle k, -1\rangle$, then the sum of all values of k is equal to

A) - 4 **B)** -2 **C)** 2 **D)** 4 **E)** 0

2. Let $\vec{u} = 2i - 4j$ and $\vec{w} = 3i - 3j$

a) Find a unit vector in the opposite direction of $\vec{u}$.

b) Find a vector of magnitude 2 in the direction of $\vec{w}$.

3. **F**ind the value of k such that the two vectors $\vec{u} = \langle 3,\ 4\rangle$ and $\vec{v} = \langle 2,\ k\rangle$ have the same direction.

4. Let $\boldsymbol{u}, \boldsymbol{v}$ & $\boldsymbol{w}$ be three vectors defined as $\boldsymbol{u} = < 1, \sqrt{\boldsymbol{3}} >$ and $\boldsymbol{v} = \sqrt{\boldsymbol{3}}\,\boldsymbol{j} + \boldsymbol{i}$, and $\boldsymbol{w} = 2\boldsymbol{u} - \boldsymbol{v}$. Then find the direction angle of $\boldsymbol{w}$.

5. If θ is an angle between the vectors $v = -i + 2j$ and $w = 2i - j$, then find $\sin(2\theta)$, where $0 \le \theta \le \pi$.