9.1 & 9.2 Recitation Exercises

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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. Find 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 $\boldsymbol{u} = \ <1, \sqrt{3}>$ and $\boldsymbol{v} = \sqrt{3}\,\boldsymbol{j} + \boldsymbol{i}$, 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 $0 \leq \theta \leq \pi$.