

Vector worksheet

Name:

Per:

1. Consider the vector $\mathbf{v} = 2\mathbf{i} + 3\mathbf{j}$ and the vector $\mathbf{w} = 4\mathbf{i} - 2\mathbf{j}$

(a) Compute $\mathbf{v} + \mathbf{w}$.

(b) Compute $\mathbf{v} - \mathbf{w}$.

(c) Compute $2\mathbf{v}$.

2. Consider the vector $\mathbf{v} = -2\mathbf{i} - 3\mathbf{j}$ and the vector $\mathbf{w} = \mathbf{i} + 2\mathbf{j}$

(a) Compute $\mathbf{v} + \mathbf{w}$.

(b) Compute $\mathbf{v} - \mathbf{w}$.

(c) Compute $2\mathbf{v}$.

3. Consider the vector $\mathbf{v} = 6\mathbf{i} + 6\mathbf{j}$ and the vector $\mathbf{w} = 5\mathbf{i} + 5\sqrt{3}\mathbf{j}$

(a) Compute the magnitude $\|\mathbf{v}\|$.

(b) Compute the magnitude $\|\mathbf{w}\|$.

(c) Compute the dot product $\mathbf{v} \cdot \mathbf{w}$

(d) What is the angle between \mathbf{v} and \mathbf{w} ?

$$\theta = \cos^{-1} \left(\frac{\mathbf{v} \cdot \mathbf{w}}{\|\mathbf{v}\| \|\mathbf{w}\|} \right)$$

4. Consider the vector $\mathbf{v} = 3\mathbf{i} + 4\mathbf{j}$ and the vector $\mathbf{w} = 5\mathbf{i} + 12\mathbf{j}$

(a) Compute the magnitude $\|\mathbf{v}\|$.

(b) Compute the magnitude $\|\mathbf{w}\|$.

(c) Compute the dot product $\mathbf{v} \cdot \mathbf{w}$

(d) What is the angle between \mathbf{v} and \mathbf{w} ?

$$\theta = \cos^{-1} \left(\frac{\mathbf{v} \cdot \mathbf{w}}{\|\mathbf{v}\| \|\mathbf{w}\|} \right)$$

5. Consider the vector $\mathbf{v} = 8\mathbf{i} + 6\mathbf{j}$ and the vector $\mathbf{w} = 4\sqrt{2}\mathbf{i} + 4\sqrt{2}\mathbf{j}$

(a) Compute the magnitude $\|\mathbf{v}\|$.

(b) Compute the magnitude $\|\mathbf{w}\|$.

(c) Compute the dot product $\mathbf{v} \cdot \mathbf{w}$

(d) What is the angle between \mathbf{v} and \mathbf{w} ?

$$\theta = \cos^{-1} \left(\frac{\mathbf{v} \cdot \mathbf{w}}{\|\mathbf{v}\| \|\mathbf{w}\|} \right)$$