I. FOR THE GIVEN VECTORS, COMPUTE THE INDICATED ITEMS, SHOWING ALL YOUR WORK ON THE EXTRA SHEETS. NOTE THAT THE SYMBOL " $\bullet$ " REPRESENTS DOT PRODUCT.

1. $\vec{v} = \langle 4, -1 \rangle$ $\vec{w} = \langle -5, -3 \rangle$

   a. $\|\vec{v}\|$ b. $10\vec{v} - 3\vec{w}$ c. $\|\vec{v} - \vec{w}\|$

2. $\vec{v} = 6\vec{i} - 2\vec{j}$ $\vec{w} = 5\vec{i}$ $\vec{t} = 3\vec{i} - \vec{j}$

   a. $\vec{v} \bullet \vec{w}$ b. $\vec{t} \bullet (\vec{v} + \vec{w})$ c. $\vec{0} \bullet \vec{w}$

   d. Find θ, the angle between vectors $\vec{v}$ & $\vec{t}$.

   e. Find a unit vector in the same direction as vector $\vec{w}$

   f. Present a computation to determine whether the vectors $\vec{w}$ & $\vec{t}$ are orthogonal.

II. EVALUATE EACH DETERMINANT.

3. $\begin{vmatrix} 4 & 6 \\ 1 & -5 \end{vmatrix}$ 4. $\begin{vmatrix} 10 & 3 \\ -5 & -2 \end{vmatrix}$ 4 ½. $\begin{vmatrix} 1 & 2 & 3 \\ -2 & 1 & 1 \\ 4 & 1 & -2 \end{vmatrix}$

III. FOR THE GIVEN VECTORS, COMPUTE THE INDICATED ITEMS.

$\vec{v} = 3\vec{i} - \vec{j} + \vec{k}$ $\vec{w} = -\vec{i} + 2\vec{j} + \vec{k}$

5. $\|\vec{v} - \vec{w}\|$ 6. $\vec{v} \bullet \vec{w}$ 7. $\vec{v} \times \vec{w}$