

Worksheet #17

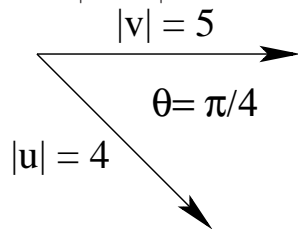
(1) Let $\mathbf{a} = -3\mathbf{i} + 2\mathbf{j} - 2\mathbf{k}$, $\mathbf{b} = -\mathbf{i} + 2\mathbf{j} - 4\mathbf{k}$, and $\mathbf{c} = 7\mathbf{i} + 3\mathbf{j} - 4\mathbf{k}$

- $\mathbf{a} \times \mathbf{b}$

- $\mathbf{a} \times (\mathbf{b} + \mathbf{c})$

- $\mathbf{a} \cdot (\mathbf{b} + \mathbf{c})$

(2) Find $|\mathbf{u} \times \mathbf{v}|$ and determine whether $\mathbf{u} \times \mathbf{v}$ is directed into the page or out of the page.



(3) Let $P(-1, 3, 1)$, $Q(0, 5, 2)$, and $R(4, 3, -1)$. Find a nonzero vector orthogonal to the plane through the points P , Q , and R .

(4) Let $P(-1, 3, 1)$, $Q(0, 5, 2)$, and $R(4, 3, -1)$. Find the area of the triangle PQR .

- (5) Use the scalar triple product to determine whether the points $A(1, 3, 2)$, $B(3, -1, 6)$, $C(5, 2, 0)$, and $D(3, 6, -4)$ lie in the same plane.