

Cross Product Part I

1. Find $\mathbf{a} \times \mathbf{b}$:

a) $\mathbf{a} = [0, 1, 1]$, $\mathbf{b} = [3, -1, 2]$

b) $\mathbf{a} = [1, 1, 1]$, $\mathbf{b} = [1, 2, 3]$

2. Find a normal vector for the plane:

a) parallel to $\mathbf{u} = [0, 1, 2]$ and $\mathbf{v} = [1, 1, 4]$

b) through the points $P = (0, -1, 1)$, $Q = (2, 0, 2)$ and $R = (1, 2, -1)$

3. Compute the area of the triangle with vertices $A = (1, 2, 1)$, $B = (2, 1, 0)$ and $C = (5, -1, 3)$.

Answers:

1. a) $[3, 3, -3]$ b) $[1, -2, 1]$

2. a) any nonzero multiple of $[2, 2, -1]$

b) any nonzero multiple of $[-5, 5, 5]$

3. $\frac{\sqrt{62}}{2}$