Calculus III . Quiz 6 Fall 2000 11/1/2000

Each problem is worth 5 points, show all work for partial credit.

1. Compute <2,1,-3> × <1,-5,-1>.

$$\begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 2 & 1 & -3 \\ 1 & -5 & -1 \end{vmatrix} = \vec{i}\begin{vmatrix} 1 & -3 \\ -5 & -1 \end{vmatrix} - \vec{j}\begin{vmatrix} 2 & -3 \\ 1 & -1 \end{vmatrix} + \vec{k}\begin{vmatrix} 2 & 1 \\ 1 & -5 \end{vmatrix}$$

$$= \vec{i}(-1-15) - \vec{j}(-2+3) + \vec{k}(-10-1)$$

$$= \vec{i}(-16) - \vec{j}(1) + \vec{k}(-11)$$

$$= -16\vec{i} - \vec{j} - 11\vec{k}$$

or $\langle -16, -1, -11 \rangle$

Nice

2. If you have vectors **a** and **b** for which **a** × **b** = 3**j**, what is **b** × **a**?

$\vec{a} \times \vec{b} = -\vec{b} \times \vec{a}$, so if $\vec{a} \times \vec{b} = 3\vec{j}$

then $\vec{b} \times \vec{a} = -3\vec{j}$