

Calc 3 - Assignment 5

Note Title

9/12/2011

① Find the cross product $\vec{a} \times \vec{b}$ for

a) $\vec{a} = \langle 6, 0, -2 \rangle$, $\vec{b} = \langle 0, 8, 0 \rangle$

b) $\vec{a} = \langle 1, 1, -1 \rangle$, $\vec{b} = \langle 2, 4, 6 \rangle$

c) $\vec{a} = \langle t, t^2, t^3 \rangle$, $\vec{b} = \langle 1, 2t, 3t^2 \rangle$

② Prove that $\vec{a} \times \vec{a} = \vec{0}$ and that

$\vec{a} \times \vec{b}$ is perpendicular to \vec{a} and to \vec{b}

③ Which expression does not make sense?

a) $\vec{a} \cdot (\vec{b} \times \vec{c})$

b) $\vec{a} \times (\vec{b} \cdot \vec{c})$

c) $\vec{a} \times (\vec{b} \times \vec{c})$

d) $(\vec{a} \cdot \vec{b}) \times \vec{c}$

e) $(\vec{a} \cdot \vec{b}) \times (\vec{c} \cdot \vec{d})$

f) $(\vec{a} \times \vec{b}) \cdot (\vec{c} \times \vec{d})$

④ Is the cross product commutative, i.e. is

$$\vec{a} \times \vec{b} = \vec{b} \times \vec{a} \quad (\text{try some examples first})$$

⑤ Find two unit vectors perpendicular to both

$$\langle 1, -1, 1 \rangle \text{ and } \langle 0, 4, 4 \rangle$$

⑥ If $\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c}$ does it follow that $\vec{b} = \vec{c}$?

If $\vec{a} \times \vec{b} = \vec{a} \times \vec{c}$ does it follow that $\vec{b} = \vec{c}$?