Tugas Kelompok 3

Vectors

1. Given three vectors $u=(1,-3,0)$, $v=(2,1,-1)$ and $w=(0,2,3)$. Determine:
   a. $\|3u+4v-5w\|$.
   b. Cosine of the angle between u and v.
   c. Orthogonal projection of v on w and vector component of v orthogonal to w.
   d. $(u\times v)\times w$ and $u\times(v\times w)$. Are they same?
   e. $u\bullet(v\times w)$.
   f. A vector that is orthogonal to both u and w.

2. Given three vectors $v_1=(2,-1,0)$, $v_2=(-1,0,2)$ and $v_3=(0,2,-1)$.
   a. Is v_1 a linear combination of v_2 and v_3? Explain the reason.
   b. Find the value of x such that $w=(1,2,x)$ is a linear combination of v_1 and v_2.
   c. Are v_1, v_2 and v_3 linearly independent? Explain the reason.
   d. Find the scalars $\alpha_1,\alpha_2,\alpha_3$ such that $(1,2,3)=\alpha_1v_1+\alpha_2v_2+\alpha_3v_3$, if they exist.