## Math 241, Sections BL1 and BL2

**Quiz # 1 BDL**

September 11, 2012

Solve both exercises. Show work to get credit.

1) [5pts.] Find the cross product $\vec{a} \times \vec{b}$ where $\vec{a} = \vec{j} + 6\vec{k}$ and $\vec{b} = 5\vec{i} - \vec{j} + 2\vec{k}$.

**Solution:**

$$\begin{aligned}\vec{a} \times \vec{b} &= \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 6 \\ 5 & -1 & 2 \end{vmatrix} \\ &= (2+6)\vec{i} - (0-30)\vec{j} + (0-5)\vec{k} \\ &= 8\vec{i} + 30\vec{j} - 5\vec{k}.\end{aligned}$$

2) [5pts.] Find an equation of the plane through the point $(9, 1, 2)$ and with normal vector $6\vec{i} + \vec{j} - \vec{k}$.

**Solution:** You know how to rederive the following (ask me if you have questions regarding that), but just memorizing the form is OK for this problem:

$$6(x-9) + 1(y-1) - 1(z-2) = 0.$$

If we want all the constants together, this is equivalent to

$$6x + y - z = 53.$$