Name: Key Quiz 2 MAC 2313

1. Let $\vec{p} = \langle 2, k, 0 \rangle$ and $\vec{q} = \langle -2, 1, 1 \rangle$.

(a) [3 points] Find k such that $\vec{p} \cdot \vec{q} = -4$.

$$\vec{p} \cdot \vec{q} = -4$$

$$\langle 2, k, 0 \rangle \cdot \langle -2, 1, 1 \rangle = -4$$

$$-4 + k = -4$$

$$k = 0$$

(b) [3 points] Find $\vec{p} \times \vec{q}$ (you may plug in your answer from (a) for t).

$$\vec{p} \times \vec{q} = \begin{vmatrix} i & j & k \\ 2 & 0 & 0 \\ -2 & 1 & 1 \end{vmatrix} = i(0) - j(2-0) + k(2-0)$$

$$= \langle 0, -2, 2 \rangle$$

THERE IS A QUESTION ON THE BACK.

2. [4 points] Find the point of intersection between $x + y + z = 0$ and the line:

$$\frac{x-1}{2} = \frac{y-2}{-1} = \frac{z-3}{-2}$$

get x, z in terms of y:

$$\frac{x-1}{2} = \frac{y-2}{-1} \qquad \frac{y-2}{-1} = \frac{z-3}{-2}$$

$$1-x = 2y-4 \qquad 4-2y = 3-z$$

$$5-2y = x \qquad 2y-1 = z$$

plug into plane:

$$5-2y + y + 2y - 1 = 0$$

$$y + 4 = 0$$

$$y = -4$$

use y to find x, z:

$$5-2(-4) = x \qquad 2(-4)-1 = z$$

$$5+8 = x \qquad -8-1 = z$$

$$13 = x \qquad -9 = z$$

so the point of intersection is $(13, -4, -9)$.

note that this is just one way to solve this problem.