

Quiz 1-Solutions

MAC 2313

Fall 2006

Full Name: _____

Score: _____

Show all of your work for full credit.

1. Given $\vec{a} = \vec{i} - 2\vec{j} + \vec{k}$ and $\vec{b} = \vec{j} + 2\vec{k}$, calculate

(a) $|\vec{a}|$

$$\begin{aligned} |\vec{a}| &= \sqrt{a_1^2 + a_2^2 + a_3^2} \\ &= \sqrt{1 + 4 + 1} \\ &= \sqrt{6} \end{aligned}$$

(b) $\vec{a} + \vec{b}$

$$\begin{aligned} \vec{a} + \vec{b} &= \langle 1, -2, 1 \rangle + \langle 0, 1, 2 \rangle \\ &= \langle 1, -1, 3 \rangle \end{aligned}$$

(c) $2\vec{a} + 4\vec{b}$

$$\begin{aligned} 2\vec{a} + 4\vec{b} &= 2\langle 1, -2, 1 \rangle + 4\langle 0, 1, 2 \rangle \\ &= \langle 2, 0, 10 \rangle \end{aligned}$$

2. Find the equation of the plane through the point $(-1, -1, 1)$ and with normal vector $\vec{i} + \vec{j} - \vec{k}$.

The equation is given as $\langle 1, 1, -1 \rangle \cdot \langle x+1, y+1, z-1 \rangle = 0$ in vector form or $x+y-z+3=0$ in scalar form.