(1 point) Find the following norms: (Type in exact answers, e.g. sqrt(2) for $\sqrt{2}$.)

(a) $||\mathbf{u}||$ for

$$\mathbf{u} = \begin{bmatrix} 7 \\ 1 \\ 5 \\ 6 \end{bmatrix}.$$

Answer: $||\mathbf{u}|| =$ sqrt(111) .

(b) $||\mathbf{u}||$ for

$$\mathbf{u} = \begin{bmatrix} -2 \\ -5 \\ 1 \\ 2 \\ -2 \end{bmatrix}.$$

Answer: $||\mathbf{u}|| =$ sqrt(38) .

(c) $||\mathbf{u}||$ for

$$\mathbf{u} = \begin{bmatrix} 6+8i \\ 7+7i \\ 4+4i \end{bmatrix}.$$

Answer: $||\mathbf{u}|| =$ sqrt(68+64+49+49) .

(1 point) Let $\mathbf{a} = \langle 2, -2, -1 \rangle$ and $\mathbf{b} = \langle 0, -2, 0 \rangle$. Compute:

$\mathbf{a} + \mathbf{b} = \langle$ 2 , -4 , -1 $\rangle$

$\mathbf{a} - \mathbf{b} = \langle$ 2 , 0 , -1 $\rangle$

$2\mathbf{a} = \langle$ 4 , -4 , -2 $\rangle$

$3\mathbf{a} + 4\mathbf{b} = \langle$ 6 , -14 , -3 $\rangle$

$|\mathbf{a}| =$ 3

(1 point) **Distance and Dot Products:** Consider the vectors

$$\mathbf{u} = \langle -8, -8, -4 \rangle \text{ and } \mathbf{v} = \langle 5, 8, -3 \rangle.$$

Compute $||\mathbf{u}|| =$ 12

Compute $||\mathbf{v}|| =$ sqrt(98)

Compute $\mathbf{u} \cdot \mathbf{v} =$ -92

(1 point) If $\vec{v} \times \vec{w} = 4\vec{i} + \vec{j} + \vec{k}$, and $\vec{v} \cdot \vec{w} = 5$, and θ is the angle between $\vec{v}$ and $\vec{w}$, then

(a) $\tan\theta =$ 3*sqrt(2)/5

(b) $\theta =$ tan^(-1)(3*sqrt(2)/5)