Math 397 Solutions Quiz 1

Name: Caleb McWhorter

1. Consider the vectors

$$\vec{a} = \langle 2, -1, 3 \rangle \qquad \vec{b} = \langle 1, 0, 4 \rangle$$

(a) (2 points) Find $(-4)\vec{a}$

$$-4\langle 2, -1, 3 \rangle = \langle -8, 4, -12 \rangle$$

(b) (2 points) Find $5\vec{b}$

$$5\langle 1, 0, 4 \rangle = \langle 5, 0, 20 \rangle$$

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

$$\langle 2, -1, 3 \rangle + \langle 1, 0, 4 \rangle = \langle 2+1, -1+0, 3+4 \rangle = \langle 3, -1, 7 \rangle$$

(d) (2 points) Find $\vec{a} - \vec{b}$

$$\langle 2, -1, 3 \rangle - \langle 1, 0, 4 \rangle = \langle 2-1, -1-0, 3-4 \rangle = \langle 1, -1, -1 \rangle$$

(e) (2 points) Find $\vec{a} \cdot \vec{b}$

$$\langle 2, -1, 3 \rangle \cdot \langle 1, 0, 4 \rangle = 2(1) + (-1)0 + 3(4) = 2 + 0 + 12 = 14$$

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1. Consider the vectors

$$\vec{a} = \langle 1,2,-1 \rangle \qquad \vec{b} = \langle 0,3,4 \rangle$$

(a) (2 points) Find $3\vec{a}$

$$3\langle 1,2,-1 \rangle = \langle 3,6,-3 \rangle$$

(b) (2 points) Find $(-2)\vec{b}$

$$-2\langle 0,3,4 \rangle = \langle 0,-6,-8 \rangle$$

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

$$\langle 1,2,-1 \rangle + \langle 0,3,4 \rangle = \langle 1+0, 2+3, -1+4 \rangle = \langle 1,5,3 \rangle$$

(d) (2 points) Find $\vec{a}-\vec{b}$

$$\langle 1,2,-1 \rangle - \langle 0,3,4 \rangle = \langle 1-0, 2-3, -1-4 \rangle = \langle 1,-1,-5 \rangle$$

(e) (2 points) Find $\vec{a}\cdot\vec{b}$

$$\langle 1,2,-1 \rangle \cdot \langle 0,3,4 \rangle = 1(0) + 2(3) + (-1)4 = 0+6-4 = 2$$