Week 7 Practice Worksheet

Vectors

1. Suppose that $\vec{v} = \langle -3, 7 \rangle$ and $\vec{w} = \langle 2, 10 \rangle$.

a. Express $\vec{v}$ and $\vec{w}$ using unit vectors.

b. Find $\|\vec{v}\|$ and $\|\vec{w}\|$.

c. Find $2\vec{v} - 5\vec{w}$.

d. Find $4\vec{w} + 3\vec{v}$.

2. Suppose that $\vec{m} = 7\vec{i} - 4\vec{j}$ and $\vec{n} = -5\vec{i} - 2\vec{j}$.

a. Express $\vec{m}$ and $\vec{n}$ using "pointy vector brackets" (i.e., $\langle a, b \rangle$).

b. Find $\|\vec{m}\|$ and $\|\vec{n}\|$.

c. Find $\vec{m} + \vec{n}$.

d. Find $3\vec{m} - \vec{n}$.

3. Suppose that $\vec{p} = \langle -1, 4 \rangle$ and $\vec{q} = \langle 3, -5 \rangle$.

a. Express $\vec{p}$ and $\vec{q}$ using unit vectors.

b. Find $\|\vec{p}\|$ and $\|\vec{q}\|$.

c. Find $2\vec{p} + 3\vec{q}$.

d. Find $2\vec{q} - 3\vec{p}$.

4. Suppose that the tail (or initial point) of $\vec{b}$ is $(2, -3)$ and the tip (or terminal point) is $(-4, 7)$. Find the components of $\vec{b}$ in order to express $\vec{b}$ using both "pointy vector brackets" and unit vectors.

5. Suppose that the tail (or initial point) of $\vec{r}$ is $(-5, 1)$ and the tip (or terminal point) is $(3, 6)$. Find the components of $\vec{r}$ in order to express $\vec{r}$ using both "pointy vector brackets" and unit vectors.

6. Suppose that $\|\vec{a}\| = 34$ and that $\vec{a}$ makes an angle of 150° with the positive x-axis. Find the components of $\vec{a}$ in order to express $\vec{a}$ using both "pointy vector brackets" and unit vectors.

7. Suppose that $\|\vec{s}\| = 18$ and that $\vec{s}$ makes an angle of -45° with the positive x-axis. Find the components of $\vec{s}$ in order to express $\vec{s}$ using both "pointy vector brackets" and unit vectors.

8. Suppose that $\vec{v} = \langle -3, 7 \rangle$ and $\vec{w} = \langle 2, 10 \rangle$.

a. Find $\vec{v} \cdot \vec{w}$.

b. Find the angle between $\vec{v}$ and $\vec{w}$.

9. Suppose that $\vec{m} = 7\vec{i} - 4\vec{j}$ and $\vec{n} = -5\vec{i} - 2\vec{j}$.

a. Find $\vec{m} \cdot \vec{n}$.

b. Find the angle between $\vec{m}$ and $\vec{n}$.

10. Suppose that $\vec{p} = \langle -1, 4 \rangle$ and $\vec{q} = \langle 3, -5 \rangle$.

a. Find $\vec{p} \cdot \vec{q}$.

b. Find the angle between $\vec{p}$ and $\vec{q}$.