

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 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.

4. 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.

5. 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.

6. 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.

7. 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} .

8. 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} .

9. 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} .