

Vectors Worksheet - Answer Key

1. Find the magnitude of $\langle -1, 5 \rangle$.

$$\sqrt{26}$$

2. Find the direction of $-\frac{\sqrt{3}}{2}\mathbf{i} + \frac{\sqrt{3}}{2}\mathbf{j}$.

$$\frac{3\pi}{4}$$

3. Describe the graph of $f(x) = \langle x, x^2 \rangle$.

It is the graph of a straight line.

4. Perform the vector operation $\langle -9, 5 \rangle - \langle -3, 4 \rangle$.

$$\langle -6, 1 \rangle$$

5. Perform the vector operation $\langle -\frac{1}{3}, \frac{2}{5} \rangle - 3\langle -\frac{1}{9}, \frac{1}{5} \rangle$.

$$\langle 0, -\frac{1}{5} \rangle$$

6. Normalize the vector $\langle 3, 4 \rangle$.

$$\langle \frac{3}{5}, \frac{4}{5} \rangle$$

7. Given $f(t) = \langle 1, t^2, \frac{1}{t} \rangle$, find $f(-1)$.

$$f(t) = \langle 1, 1, 1 \rangle$$

8. Is $f(x, y) = x^2 + y^2$ a vector function?

No, f is a scalar function.

9. Find the direction of $f(u, v) = u + v$.

$f(u, v)$ is not a vector.

10. Find the value of a if $a\mathbf{i} + \frac{1}{4}\mathbf{j}$ is a unit vector.

$$\pm\sqrt{\frac{15}{16}}$$