

Vector Operations, Unit Vectors, Direction Angle

Date _____ Period _____

Perform the given operations. Leave your answer in component form.

1) $\mathbf{f} = \langle -6, 11 \rangle$

$\mathbf{g} = \langle 5, -4 \rangle$

Find: $-\mathbf{f} + \mathbf{g}$

2) $\mathbf{a} = \langle -8, 4 \rangle$

$\mathbf{g} = \langle 10, -4 \rangle$

Find: $\mathbf{a} + \mathbf{g}$

3) $\mathbf{u} = \langle -7, 9 \rangle$

$\mathbf{v} = \langle 12, 5 \rangle$

Find: $7\mathbf{u} + 10\mathbf{v}$

4) $\mathbf{a} = \langle 4, -5 \rangle$

$\mathbf{g} = \langle 3, 6 \rangle$

Find: $-\mathbf{a} - \mathbf{g}$

5) $\mathbf{u} = \langle 5, 8 \rangle$

$\mathbf{v} = \langle 1, -11 \rangle$

Find: $9\mathbf{u} + 6\mathbf{v}$

6) $\mathbf{f} = \langle 2\sqrt{3}, -6 \rangle$

Unit vector in the direction of \mathbf{f}

7) $\mathbf{u} = \langle 2\sqrt{2}, -3 \rangle$

Unit vector in the direction of \mathbf{u}

8) $\mathbf{u} = \langle -8, 5 \rangle$

Unit vector in the direction of \mathbf{u} **Given the magnitude and direction angle, write each vector in component form.**

9) $|\mathbf{m}| = 90, 114^\circ$

10) $|\mathbf{m}| = 64, 150^\circ$

11) $|\mathbf{r}| = 29, 24^\circ$

12) $|\mathbf{k}| = 3, 120^\circ$

13) $|\mathbf{a}| = 75, 120^\circ$

**Given the initial and terminal points, find the following information for each vector:
Component form, direction angle.**

14) \overrightarrow{CD} where $C = (1, -9)$ $D = (2, 1)$

15) \overrightarrow{CD} where $C = (9, -6)$ $D = (4, -7)$

16) \overrightarrow{PQ} where $P = (-2, 1)$ $Q = (-1, 3)$

17) \overrightarrow{AB} where $A = (-6, -1)$ $B = (-5, 10)$

18) \overrightarrow{RS} where $R = (-1, -7)$ $S = (7, -1)$

Answers to Vector Operations, Unit Vectors, Direction Angle

1) $\langle 11, -15 \rangle$

5) $\langle 51, 6 \rangle$

9) $\langle -36.61, 82.22 \rangle$

13) $\left\langle -\frac{75}{2}, \frac{75\sqrt{3}}{2} \right\rangle$

17) $\langle 1, 11 \rangle$
84.81°

2) $\langle 2, 0 \rangle$

6) $\left\langle \frac{1}{2}, -\frac{\sqrt{3}}{2} \right\rangle$

10) $\langle -32\sqrt{3}, 32 \rangle$

14) $\langle 1, 10 \rangle$
84.29°

18) $\langle 8, 6 \rangle$
36.87°

3) $\langle 71, 113 \rangle$

7) $\left\langle \frac{2\sqrt{34}}{17}, -\frac{3\sqrt{17}}{17} \right\rangle$

11) $\langle 26.49, 11.8 \rangle$

15) $\langle -5, -1 \rangle$
191.31°

4) $\langle -7, -1 \rangle$

8) $\left\langle -\frac{8\sqrt{89}}{89}, \frac{5\sqrt{89}}{89} \right\rangle$

12) $\left\langle -\frac{3}{2}, \frac{3\sqrt{3}}{2} \right\rangle$

16) $\langle 1, 2 \rangle$
63.43°