

Write each of the following as the sum of unit vectors; also, find the magnitude and the direction of the vector. Round your answers to the nearest hundredth.

1. Initial pt: $(-3, -5)$; Terminal point: $(5, 1)$

**Vector as sum
of unit vectors:**

Magnitude:

Direction:

2. Initial point: $(-3, 11)$; Terminal point: $(9, 40)$

**Vector as sum
of unit vectors:**

Magnitude:

Direction:

3. Initial pt: $(-4.2, 5)$; Terminal point: $(3.7, -12.9)$

**Vector as sum
of unit vectors:**

Magnitude:

Direction:

4. Initial pt: $(1.64, 7.21)$; Terminal pt $(-2.33, 3.86)$

**Vector as sum
of unit vectors:**

Magnitude:

Direction:

Answers:

1) $8\vec{i} + 6\vec{j}$; $\|\vec{v}\| = 10$; $\theta = 36.87^\circ$

2) $12\vec{i} + 29\vec{j}$; $\|\vec{v}\| = 31.38$; $\theta = 67.52^\circ$

3) $7.9\vec{i} - 17.9\vec{j}$; $\|\vec{v}\| = 19.57$; $\theta = 293.81^\circ$

4) $-3.97\vec{i} - 3.35\vec{j}$; $\|\vec{v}\| = 5.19$; $\theta = 220.16^\circ$

For each of the following, find: (a) $-5\vec{u} + 2\vec{v}$ (b) $\frac{1}{2}\vec{u} - \vec{v}$ Write answers in the form of the original vectors.

5. $\mathbf{u} = \langle 5, 3 \rangle, \mathbf{v} = \langle -4, 0 \rangle$

6. $\mathbf{u} = \mathbf{i} + \mathbf{j}, \mathbf{v} = 2\mathbf{i} - 3\mathbf{j}$

7. $\mathbf{u} = -9\mathbf{j}, \mathbf{v} = -6\mathbf{i} + 10\mathbf{j}$

8. $\mathbf{u} = 2\mathbf{i} - \mathbf{j}, \mathbf{v} = -\mathbf{i} + \mathbf{j}$

Find a unit vector in the direction of the given vector. Write your answer in the same form as the original vector.

9. $\mathbf{u} = \langle 6, 0 \rangle$

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

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

12. $\mathbf{v} = 4\mathbf{i} - 3\mathbf{j}$

13. $\mathbf{w} = \mathbf{i} - 2\mathbf{j}$

14. $\mathbf{w} = -3\mathbf{i}$

More Resultant Practice: Find the magnitude of the resultant given the magnitude of \vec{v} and \vec{u} and the measure of the angle θ between the vectors. Also, find the measure of the angle that the resultant makes with \vec{u} . Round to the nearest hundredth.

$\|\vec{u}\| = 18$

$\|\vec{u}\| = 8.2$

1. $\|\vec{v}\| = 23$

2. $\|\vec{v}\| = 4.7$

$\theta = 37^\circ$

$\theta = 83.9^\circ$

5) a) $\langle -33, -15 \rangle$

b) $\langle 6.5, 1.5 \rangle$

6) a) $-\vec{i} - 11\vec{j}$

b) $-1.5\vec{i} + 3.5\vec{j}$

7) a) $-12\vec{i} + 65\vec{j}$

b) $6\vec{i} - 14.5\vec{j}$

8) a) $-12\vec{i} + 7\vec{j}$

b) $2\vec{i} - 1.5\vec{j}$

9) $\langle 1, 0 \rangle$

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

11) $\left\langle \frac{5}{13}, -\frac{12}{13} \right\rangle$

12) $\frac{4}{5}\vec{i} - \frac{3}{5}\vec{j}$

13) $\frac{\sqrt{5}}{5}\vec{i} - \frac{2\sqrt{5}}{5}\vec{j}$

14) $-\vec{i}$

more resultant practice: 1) $\|\vec{u} + \vec{v}\| = 38.91; V = 20.86^\circ$

2) $\|\vec{u} + \vec{v}\| = 9.88; V = 28.23^\circ$