Unit Vectors WS   Name _____
2020

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

Vector as sum of unit vectors:	Magnitude:	Direction:

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

Vector as sum of unit vectors:	Magnitude:	Direction:

Answers:

1) $8\vec{i} + 6\vec{j}$; $\|\vec{v}\| = 10$; $\theta = 36.87°$ 2) $12\vec{i} + 29\vec{j}$; $\|\vec{v}\| = 31.38$; $\theta = 67.52°$

3) $7.9\vec{i} - 17.9\vec{j}$; $\|\vec{v}\| = 19.57$; $\theta = 293.81°$ 4) $-3.97\vec{i} - 3.35\vec{j}$; $\|\vec{v}\| = 5.19$; $\theta = 220.16°$

For each of the following, find:

(a) $-5\vec{u}+2\vec{v}$

(b) $\dfrac{1}{2}\vec{u}-\vec{v}$ ***Write answers in the form of the original vectors.***

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

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

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

8. $\vec{u}=\langle 2,-1\rangle$, $\vec{v}=\langle -1,1\rangle$

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

9. $\vec{v}=\langle 6,0\rangle$

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

11. $\vec{t}=\langle 5,-12\rangle$

12. $\vec{m}=4\vec{i}-3\vec{j}$

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

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

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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) $\langle -12,7\rangle$ b) $\langle 2,-1.5\rangle$

9) $\langle 1,0\rangle$ 10) $\left\langle -\dfrac{\sqrt{2}}{2},\dfrac{\sqrt{2}}{2}\right\rangle$ 11) $\left\langle \dfrac{5}{13},-\dfrac{12}{13}\right\rangle$ 12) $\dfrac{4}{5}\vec{i}-\dfrac{3}{5}\vec{j}$ 13) $\dfrac{\sqrt{5}}{5}\vec{i}-\dfrac{2\sqrt{5}}{5}\vec{j}$ 14) $-\vec{i}$