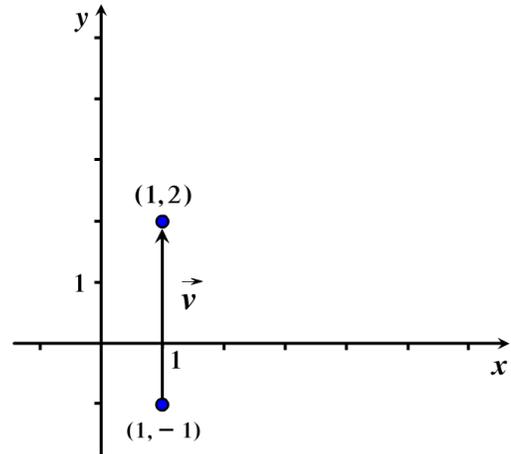
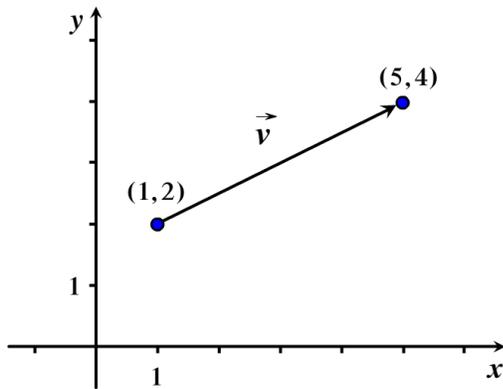


- 1) Find the component form of the vector \vec{v} and sketch the vector with its initial point at the origin.



- 2) Find the component form of the vectors \vec{u} and \vec{v} whose initial and terminal points are given. Show that \vec{u} and \vec{v} are equivalent.

$$\vec{u}: (3, 2), (5, 6)$$

$$\vec{v}: (1, 4), (3, 8)$$

- 3) The initial and terminal points of vector \vec{v} are $(4, -6)$ and $(3, 6)$ respectively. Write the vector as the linear combination of the standard unit vectors \mathbf{i} and \mathbf{j} .

- 4) Find each scalar multiple of $\vec{v} = \langle -2, 3 \rangle$.

a) $2\vec{v}$

b) $-3\vec{v}$

c) $0\vec{v}$

d) $-\frac{1}{2}\vec{v}$

5) Find the vector \vec{v} where $\vec{u} = \langle 2, -1 \rangle$ and $\vec{w} = \langle 1, 2 \rangle$.

a) $\vec{v} = \frac{3}{2}\vec{u}$

b) $\vec{v} = \vec{u} + \vec{w}$

c) $\vec{v} = \vec{u} + 2\vec{w}$

d) $\vec{v} = 5\vec{u} - 3\vec{w}$

6) The vector $\vec{v} = \langle -1, 3 \rangle$ and its initial point is $(4, 2)$, find the terminal point.

7) Find the magnitude of \vec{v} :

a) $\vec{v} = 7\mathbf{i}$

b) $\vec{v} = \langle 12, -5 \rangle$

c) $\vec{v} = -10\mathbf{i} + 3\mathbf{j}$

8) Find the unit vector in the direction of \vec{v} and verify that it has a length of 1.

a) $\vec{v} = \langle 3, 12 \rangle$

b) $\vec{v} = \left\langle \frac{3}{2}, \frac{5}{2} \right\rangle$

9) Given that $\vec{u} = \langle 1, -1 \rangle$ and $\vec{v} = \langle -1, 2 \rangle$ find the following:

a) $\|\vec{u} + \vec{v}\|$

b) $\left\| \frac{\vec{u} + \vec{v}}{\|\vec{u} + \vec{v}\|} \right\|$

10) Find $\vec{u} + \vec{v}$. Then demonstrate the triangle inequality using the vectors $\vec{u} = \langle 2, 1 \rangle$ and $\vec{v} = \langle 5, 4 \rangle$.

11) Find vector \vec{v} with a magnitude of 2 and the same direction as $\vec{u} = \langle \sqrt{3}, 3 \rangle$

12) Find the component form of \vec{v} given that its magnitude is equal to 2 and the angle it makes with the positive x -axis is $\theta = 150^\circ$.

13) Find the component form of $\vec{u} + \vec{v}$ given that $\|\vec{u}\| = 1$, $\|\vec{v}\| = 3$ and the angles that \vec{u} and \vec{v} make with the positive x -axis is $\theta_u = 0^\circ$ and $\theta_v = 45^\circ$.

14) Find a and b such that $\vec{v} = a\vec{u} + b\vec{w}$, where $\vec{u} = \langle 1, 2 \rangle$, $\vec{w} = \langle 1, -1 \rangle$ and $\vec{v} = \langle 2, 1 \rangle$

15) Find a unit vector parallel to and perpendicular to the graph $f(x) = x^2$ at the point $(3, 9)$.

16) Three forces with magnitudes of 75 pounds, 100 pounds, and 125 pounds act on an object at angles of 30° , 45° , and 120° , respectively, with the positive x -axis. Find the direction and magnitude of the resultant force.

17) Use the figure below to determine the tension in each cable supporting the given load.

