Example 1

Find (a) $\vec{u} + \vec{v}$ and (b) $\vec{u} - \vec{v}$ if $\vec{u} = \langle 2,1 \rangle$ and $\vec{v} = \langle 3,-4 \rangle$.

Example 2

Subtract $\vec{k}$ = (6, 3) from $\vec{v}$ = (-4, 1).

Example 3

Add the vectors $\vec{a}$ = (15, 9) and $\vec{b}$ = (32, 6).

Example 4

Add the vectors $\vec{a}$ = (-11, 23) and $\vec{b}$ = (14, 8).

Example 5

Subtract $\vec{k}$ = (13, 3) from $\vec{v}$ = (-10, 11).

Answer 1

Substitute the given values of $u1$, $u2$, $v1$ and $v2$ into the definition of vector addition.

$\vec{u} + \vec{v} = \langle u1+v1,\ u2+v2 \rangle = \langle 3+2,\ 1+(-4) \rangle = \langle 5, -3 \rangle$

Rewrite the difference $\vec{u} - \vec{v}$ as a sum $\vec{u} + (-\vec{v})$. We will need to determine the components of $-\vec{v}$

Recall that $-\vec{v}$ is a scalar multiple of -1 times v. From the definition of scalar multiplication, we have: $-\vec{v} = -1 \cdot \langle v1, v2 \rangle = -1 \cdot \langle 5, -3 \rangle = \langle -5, 3 \rangle$

Now add the components of $\vec{u}$ and $-\vec{v}$.

$\vec{u} + (-\vec{v}) = \langle 2 + (-3),\ 4+3 \rangle = \langle -1, 7 \rangle$.

Answer 2

$\vec{a} = \vec{v} + (\overrightarrow{-k})$

$\vec{a} = (6 + 4, 3-1) = (10, 2)$.

Answer 3

$\vec{c} = \vec{a} + \vec{b}$

$\vec{c} = (15 + 32, 9+6) = (47, 15)$.

Answer 4

$\vec{c} = \vec{a} + \vec{b}$

$\vec{c} = ((-11) + 14, 14+8) = (3, 22)$.

Answer 5

$\vec{a} = \vec{v} + (\overrightarrow{-k})$

$\vec{a} = (13 + 10, 3 - 11) = (23, -8)$.