

Example 1. If $P = (3, -4, -1)$ and $Q = (5, -2, -2)$, find the component form and length of the vector \overrightarrow{PQ} .

Example 2. let $\mathbf{u} = \langle 1, -2, 4 \rangle$ and $\mathbf{v} = \langle 0, 3, -1 \rangle$. Compute the following.

(a) $5\mathbf{u} - 3\mathbf{v}$

(b) $|-2\mathbf{u}|$

Example 3. Write the vector $\mathbf{v} = \langle -1, 3, 5 \rangle$ as a linear combination of the standard unit vectors \mathbf{i} , \mathbf{j} , and \mathbf{k} .

Example 4. Find a unit vector in the direction of $\mathbf{v} = \langle -2, 1, 2 \rangle$.

Example 5. An airplane is flying in the direction 30° west of North at 800 km/hr. Find the component form of the velocity vector.

Example 6. A 50 lb weight is suspended from the ceiling by two cables. One of the cables forms an angle of 60° with the ceiling and the other an angle of 30° from the ceiling. Find the forces \mathbf{F}_1 and \mathbf{F}_2 acting on the wires.
