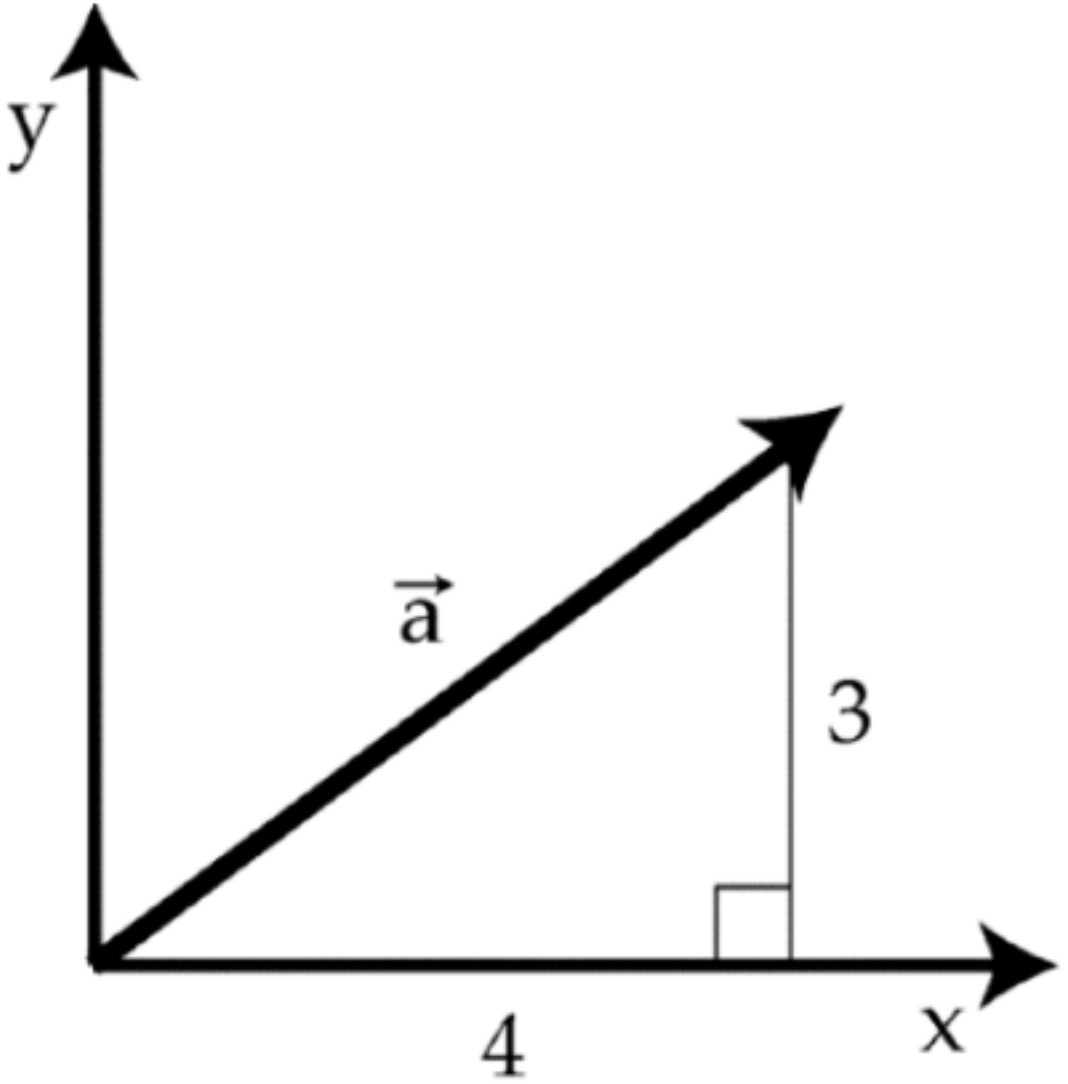
magnitudes and direction

example

unit vectors


y
$\vec{a}$
3
4
x

magnitudes and direction

example

What is the direction of $\vec{a} = [4,3]$?

A way of representing the direction of a vector independent of its length is using unit vectors

A unit vector is a vector of magnitude 1 and is obtained by diving a vector by its length (normalizing)
Unit vectors can be used to express the direction of a vector independent of its magnitude.

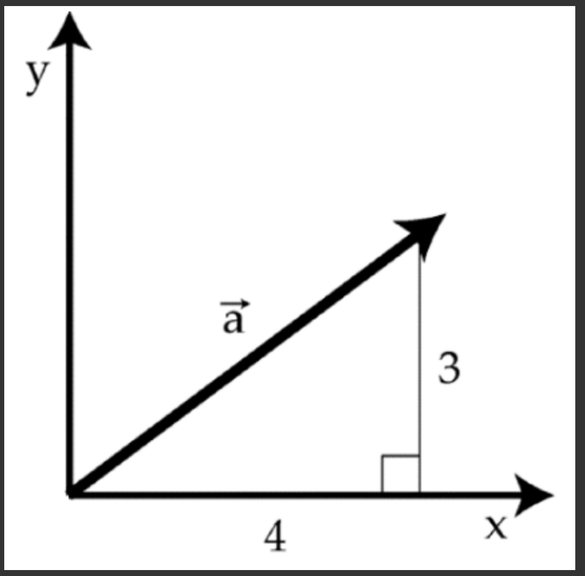
$$\frac{\vec{a}}{\|a\|} = \frac{[4,3]}{5} = \left[\frac{4}{5}, \frac{3}{5}\right]$$

by dividing each component of the vector by the same number,

we leave the direction of the vector unchanged, while we change the magnitude.

If done correctly, the magnitude of the unit vector must be equal to 1.

How do we verify this? By calculating the magnitude of the unit vector.



vector addition and subtraction