

1 1.1: Vectors

Definitions:

vector:

addition

scalar multiplication

subtraction

magnitude:

unit vector:

i and **j**:

Examples:

Given the vectors $\mathbf{a} = \langle 3, -5 \rangle$ and $\mathbf{b} = 2\mathbf{i} - 4\mathbf{j}$, write $\mathbf{i} + \mathbf{j}$ in terms of \mathbf{a} and \mathbf{b} .

A 10 kg sign is to be hung from chords as shown in the diagram given in class. Find the tensions (in Newtons) in each of the chords.

On Your Own: Given $\mathbf{a} = \langle 2, 1 \rangle$ and $\mathbf{b} = 6\mathbf{i} + 7\mathbf{j}$, find each of the following: $\mathbf{a} + \mathbf{b}$, $5\mathbf{a} - 2\mathbf{b}$, and a unit vector in the direction of \mathbf{b} .

$$\langle 8, 8 \rangle, \langle -2, -9 \rangle, \frac{6}{\sqrt{85}}\mathbf{i} + \frac{7}{\sqrt{85}}\mathbf{j}$$