1. Find the vector going from point a to point b and write it in column-vector form and unit-vector form:
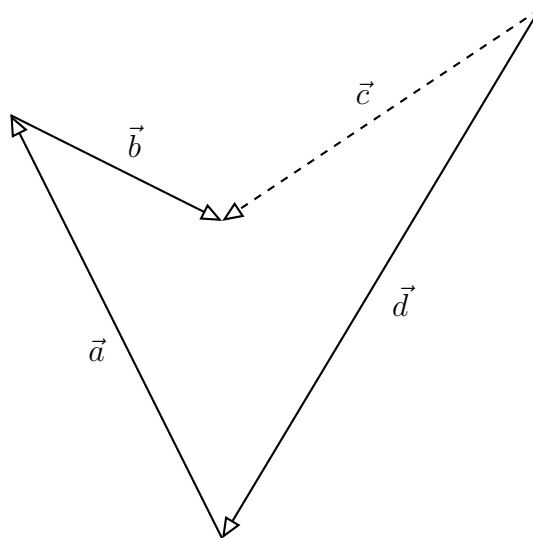
$$a = (-1, 1, 2) \qquad b = (3, 5, 8)$$

2. Find a value for n that will make the magnitude of vector $\vec{a}$ 5:

$$\vec{a} = \begin{pmatrix} 1 \\ 2 \\ n \end{pmatrix}$$

For the same vector $\vec{a}$ as above, is it possible to find a value for n that will make $\vec{a}$ have a magnitude of 1? Find such a value n or explain why no such value exists:

3. Consider the path formed by the 4 vectors in the diagram below:

(a) Fill in $+$ or $-$ signs in between the vectors on the left hand side of the equation below to make the equation true:

$$\vec{a} \quad \vec{b} \quad \vec{c} \quad \vec{d} \quad = \quad \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

(b) Let the following be the values for the vectors in the diagram:

$$\vec{a} = \begin{pmatrix} -2 \\ 4 \end{pmatrix} \qquad \vec{b} = \begin{pmatrix} 2 \\ 3 \end{pmatrix} \qquad \vec{c} = \begin{pmatrix} c_x \\ c_y \end{pmatrix} \qquad \vec{d} = \begin{pmatrix} -3 \\ -5 \end{pmatrix}$$

Find the value of c_x and c_y:

4. In the diagram below, the magnitude of $\vec{a}$ is 10 and the angle between $\vec{a}$ and $\vec{b}$ is 50°.
   Find the magnitude of $\vec{b}$ that will make the dot product $\vec{a} \cdot \vec{b} = 10$