

Zadatak 24. Dani su vektori $\vec{a} = -\vec{i} + 2\vec{j}$, $\vec{b} = 3\vec{i} + 4\vec{j}$ i $\vec{c} = -2\vec{i} + \vec{j}$. Odredi vektor \vec{v} kolinearano s \vec{c} , a duljine jednake duljini vektora $\vec{a} + \vec{b}$.

Rješenje.

$$\vec{a} = -\vec{i} + 2\vec{j}$$

$$\vec{b} = 3\vec{i} + 4\vec{j}$$

$$\vec{c} = -2\vec{i} + \vec{j}$$

$$\vec{v} = \alpha \vec{c}$$

$$|\vec{v}| = |\vec{a} + \vec{b}|$$

$$\vec{a} + \vec{b} = -\vec{i} + 2\vec{j} + 3\vec{i} + 4\vec{j} = 2\vec{i} + 6\vec{j}$$

$$|\vec{a} + \vec{b}| = \sqrt{2^2 + 6^2} = \sqrt{40} = 2\sqrt{10} \implies \alpha = \pm 2\sqrt{10}$$

$$|\vec{c}| = \sqrt{(-2)^2 + 1^2} = \sqrt{5}$$

$$\vec{e} = \frac{1}{|\vec{c}|} \cdot \vec{c} = \frac{1}{\sqrt{5}}(-2\vec{i} + \vec{j})$$

$$\vec{v} = \pm 2\sqrt{10} \cdot \frac{1}{\sqrt{5}}(-2\vec{i} + \vec{j}) = \pm 2\sqrt{2}(-2\vec{i} + \vec{j})$$

$$\vec{v}_1 = -4\sqrt{2}\vec{i} + 2\sqrt{2}\vec{j}$$

$$\vec{v}_2 = 4\sqrt{2}\vec{i} - 2\sqrt{2}\vec{j}$$