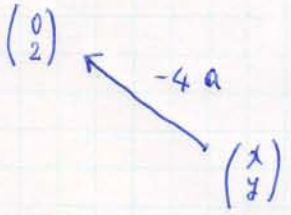
2007. 9. 28

問　$\mathbf{a} = \begin{pmatrix} 4 \\ -5 \end{pmatrix}$，終点が $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$ で $\mathbf{a}$ と向きが反対で，大きさが 4 倍のベクトルの始点を求めよ．

答　$\mathbf{a} = \begin{pmatrix} 4 \\ -5 \end{pmatrix} \Rightarrow \underbrace{-4\mathbf{a}}_{\text{向きが反対で 4 倍.}} = \begin{pmatrix} -16 \\ 20 \end{pmatrix}$

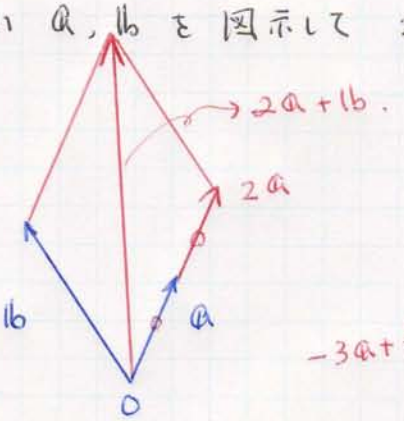


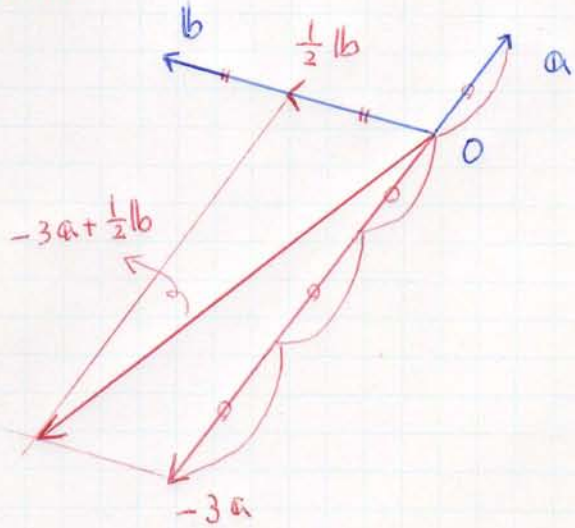
$\Rightarrow -4\mathbf{a} = \begin{pmatrix} -x \\ 2-y \end{pmatrix} = \begin{pmatrix} -16 \\ 20 \end{pmatrix}$

$\therefore\ x = 16,\ y = -18.$

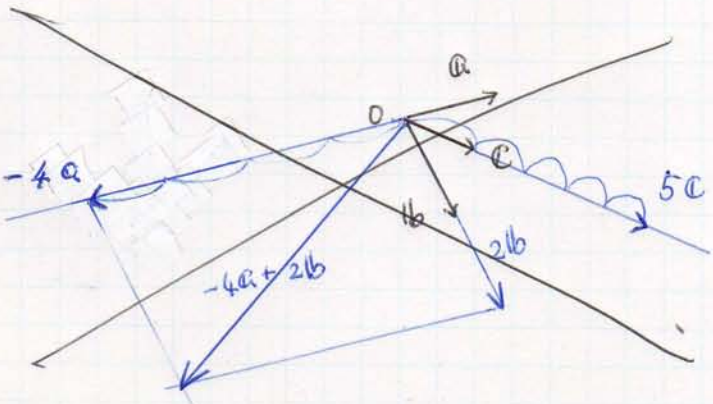
$\therefore$ 始点 $\begin{pmatrix} 16 \\ -18 \end{pmatrix}$.

問　平行でない $\mathbf{a}, \mathbf{b}$ を図示して $2\mathbf{a}+\mathbf{b}$，$-3\mathbf{a}+\frac{1}{2}\mathbf{b}$ を図示せよ。

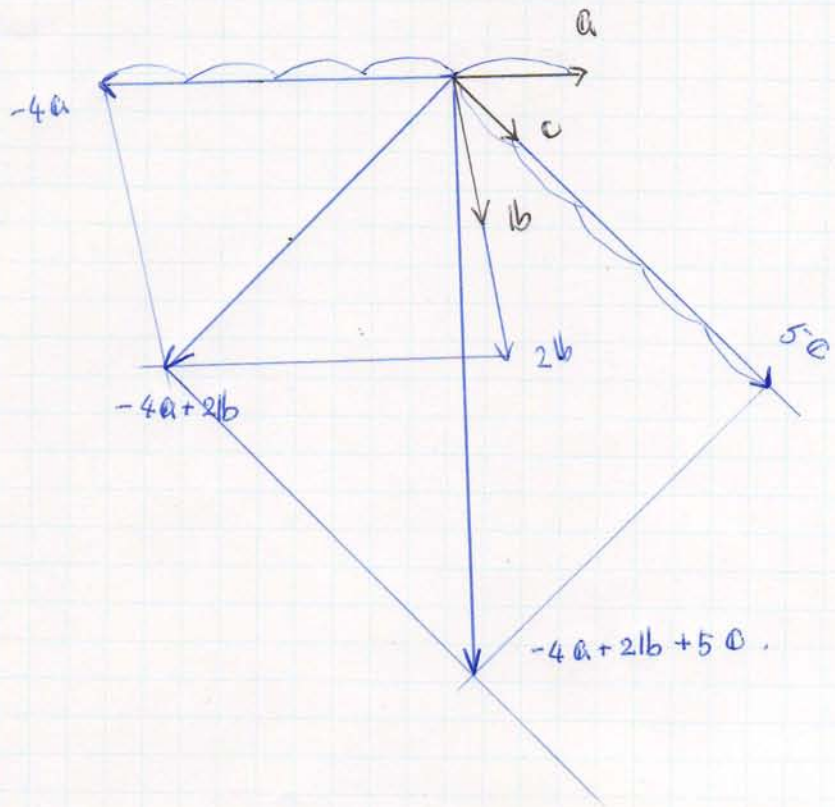




問



例



例　$\mathbf{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} -4 \\ 5 \end{pmatrix}$, $\mathbf{c} = \begin{pmatrix} -10 \\ 1 \end{pmatrix}$ を $\mathbf{a}$, $\mathbf{b}$ を用いて表示せよ.

$\begin{pmatrix} -10 \\ 1 \end{pmatrix} = t\begin{pmatrix} 2 \\ 3 \end{pmatrix} + s\begin{pmatrix} -4 \\ 5 \end{pmatrix}$ とおくと, $\begin{cases} 2t - 4s = -10 \\ 3t + 5s = 1 \end{cases}$.

連立方程式を解いて $t = \frac{-23}{11}$, $s = \frac{16}{11}$.

$\therefore \quad \mathbf{c} = -\frac{23}{11}\mathbf{a} + \frac{16}{11}\mathbf{b}$.