

$$\Rightarrow \begin{cases} 4t - 2 = 3r \\ 3t = 6r \end{cases} \leftarrow \begin{matrix} r_j \\ r_i \end{matrix}$$

$$\Leftrightarrow 3t - 6r = 0 \quad \Leftrightarrow 3t(1 - 2r) = 0$$

$$\Leftrightarrow t = 0 \text{ tai } 1 - 2r = 0 \quad \Leftrightarrow t = 0 \text{ tai } r = \frac{1}{2}$$

$$t = 0: 4 \cdot 0 - 2 = 3r \quad | :3 \quad \Leftrightarrow r = -\frac{2}{3}$$

$$r = \frac{1}{2}: 4t - 2 = 3 \cdot \frac{1}{2} \quad \Leftrightarrow 4t = \frac{7}{2} \quad | :4 \quad \Leftrightarrow t = \frac{7}{8}$$

Varh. $t = 0$ tai $t = \frac{7}{8}$

a) $\bar{a} \uparrow \uparrow \bar{b}$

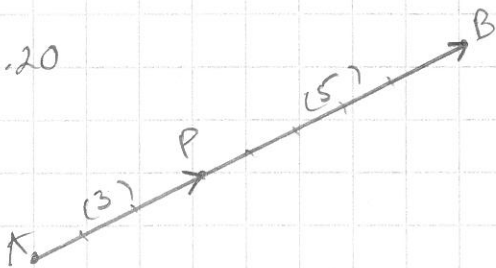
c-kohta

$$\begin{cases} t = 0: \bar{a} = -\frac{2}{3}\bar{b} \Rightarrow \bar{a} \perp \bar{b} \downarrow \\ t = \frac{7}{8}: \bar{a} = \frac{1}{2}\bar{b} \Rightarrow \bar{a} \uparrow \uparrow \bar{b} \uparrow \end{cases}$$

Varh. $t = \frac{7}{8}$

b) $\bar{a} \perp \bar{b} \Rightarrow \underline{t = 0}$

20.20



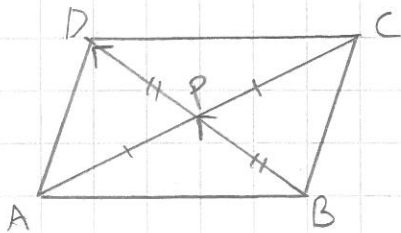
$A = (-3, 7), B = (5, -9)$

$\overline{AB} = 8\bar{i} - 16\bar{j}$

$\overline{AP} = \frac{3}{8}\overline{AB} = \frac{3}{8}(8\bar{i} - 16\bar{j}) = 3\bar{i} - 6\bar{j}$

$\Rightarrow P = (-3 + 3, 7 - 6) = (0, 1)$

20.16



$A = (2, -3), B = (6, 5), D = (-2, 1)$

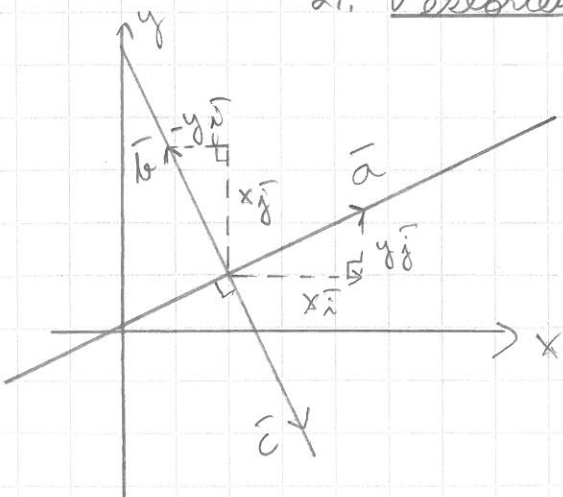
Summitteiden leikeistäjät $\frac{1}{2}$: osat toisensa

$\overline{BD} = -8\bar{i} - 4\bar{j}$

$\Rightarrow \overline{BP} = \frac{1}{2}\overline{BD} = -4\bar{i} - 2\bar{j}$

$\Rightarrow P = (6 - 4, 5 - 2) = \underline{(2, 3)}$

21. Vektorien pistetulo



$$\begin{cases} \bar{a} = x\bar{i} + y\bar{j} \\ \bar{c} = -y\bar{i} + x\bar{j} \end{cases}$$

$\bar{c} \perp \bar{a} \Leftrightarrow \bar{c} \parallel \bar{b} \Leftrightarrow \bar{c} = t\bar{b} = -ty\bar{i} + tx\bar{j}$

$\Leftrightarrow \underbrace{x \cdot (-ty)} + \underbrace{y \cdot tx} = 0$

\bar{i} :n kertoimet \bar{j} :n kertoimet
 \bar{a} :lle \bar{c} :lle \bar{a} :lle \bar{c} :lle