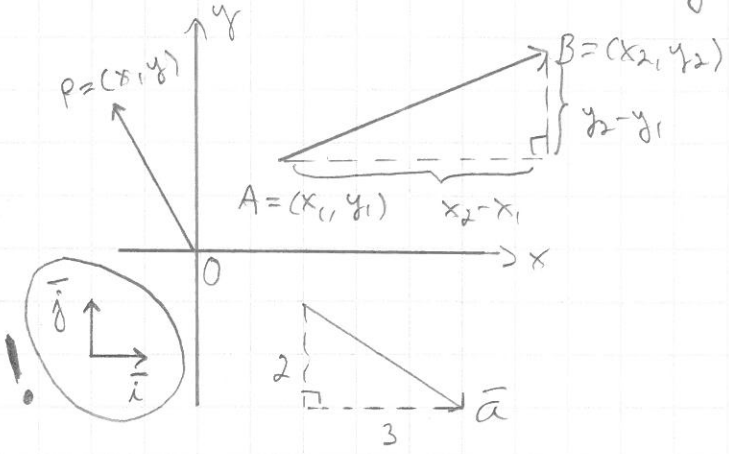
18. Vektori xy-koordinaatistossa



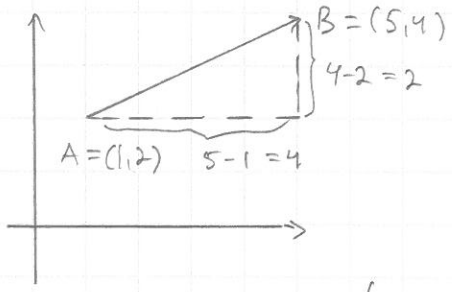
$\bar{a} = 3\bar{i} - 2\bar{j}$

$|\bar{a}| = \sqrt{3^2+(-2)^2} = \sqrt{9+4} = \sqrt{13}$

$\overline{AB} = (x_2 - x_1)\bar{i} + (y_2 - y_1)\bar{j}$

$|\overline{AB}| = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

$\overline{OP} = x\bar{i} + y\bar{j}$ jutteen P paikkavektori



18.8 a) $\bar{a} = 3\bar{i} + 2\bar{j}$, $|\bar{a}| = \sqrt{3^2+2^2} = \sqrt{9+4} = \sqrt{13}$

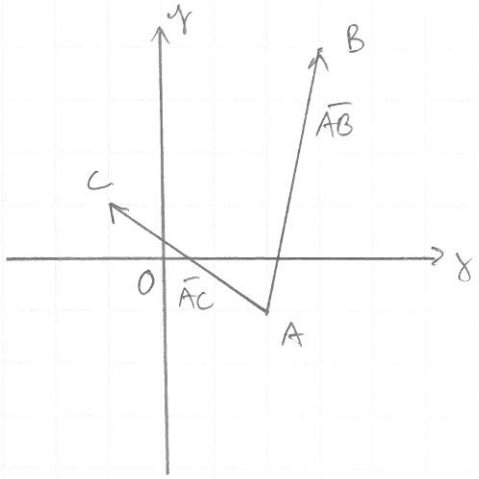
b) $\bar{b} = \bar{i} - 4\bar{j}$, $|\bar{b}| = \sqrt{1^2+(-4)^2} = \sqrt{1+16} = \sqrt{17}$

c) $5\bar{a} - 2\bar{b} = 5(3\bar{i}+2\bar{j}) - 2(\bar{i}-4\bar{j}) = 15\bar{i} + 10\bar{j} - 2\bar{i} + 8\bar{j} = 13\bar{i} + 18\bar{j}$

$|5\bar{a} - 2\bar{b}| = \sqrt{13^2+18^2} = \sqrt{493}$

Esim. $A = (2,-1)$, $B = (3,4)$ ja $\overline{AC} = -3\bar{i} + 2\bar{j}$
Määritä $\overline{AB}$, $|\overline{AB}|$ ja piste C.

Ratk.



$\overline{AB} = (3-2)\bar{i} + (4-(-1))\bar{j} = \bar{i} + 5\bar{j}$

$|\overline{AB}| = \sqrt{1^2+5^2} = \sqrt{26}$

1° $C = (x,y)$

$\overline{AC} = (x-2)\bar{i} + (y-(-1))\bar{j} = -3\bar{i} + 2\bar{j}$

$\Rightarrow \begin{cases} x-2 = -3 & \Leftrightarrow x = -1 \\ y+1 = 2 & \Leftrightarrow y = 1 \end{cases}$

$\Rightarrow C = (-1,1)$

2° $\overline{OC} = \overline{OA} + \overline{AC}$

$= (2\bar{i} - \bar{j}) + (-3\bar{i} + 2\bar{j}) = -\bar{i} + \bar{j} \Rightarrow C = (-1,1)$

3° $C = (2+(-3), -1+2) = (-1,1)$