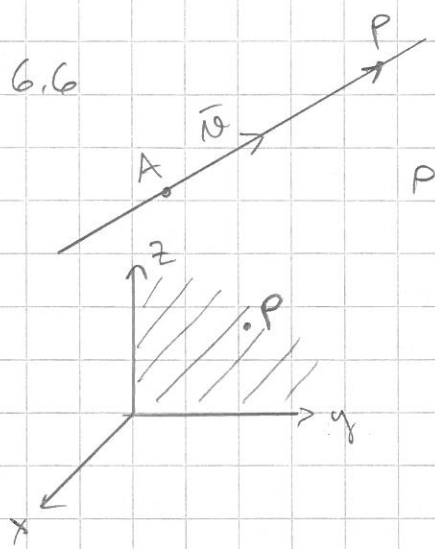
$$\Rightarrow \begin{cases} x = \dots \\ y = \dots \\ z = \dots \end{cases}$$ suoran parametriesitys, parametri $t \in \mathbb{R}$

$\overline{OP} = \overline{OA} + \overline{AP} = \overline{OA} + t\overline{AB}$ suoran vektoriyhtälö

6.6



$A = (6,0,8)$, $\vec{v} = \vec{i} + 3\vec{j} - 4\vec{k}$

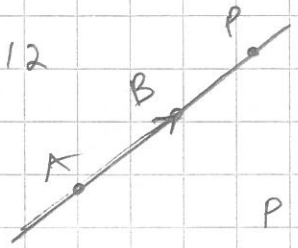
P on suoralla $\Leftrightarrow \overline{AP} \parallel \vec{v} \Leftrightarrow \overline{AP} = t\vec{v} = t\vec{i} + 3t\vec{j} - 4t\vec{k}$

$\Rightarrow P = (6+t, 0+3t, 8-4t)$

P on yz-tasolla $\Leftrightarrow x = 0 \Leftrightarrow 6 + t = 0 \Leftrightarrow t = -6$

$\Rightarrow P = (6-6, 0+3\cdot(-6), 8-4\cdot(-6)) = (0, -18, 32)$

6.12



$A = (6,0,8)$, $B = (3,5,6)$

$\overline{AB} = -3\vec{i} + 5\vec{j} - 2\vec{k}$

P on suoralla $\Leftrightarrow \overline{AP} \parallel \overline{AB} \Leftrightarrow \overline{AP} = t\overline{AB} = -3t\vec{i} + 5t\vec{j} - 2t\vec{k}$

$\Rightarrow P = (6-3t, 0+5t, 8-2t)$

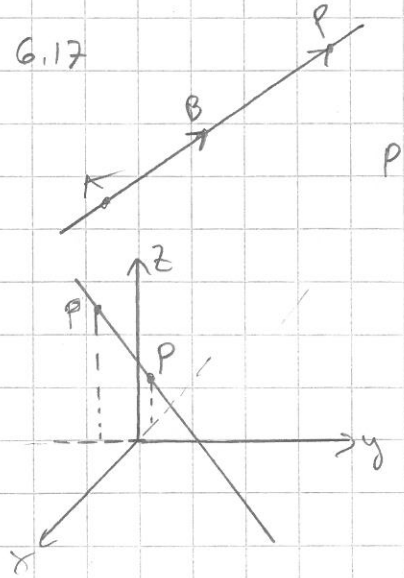
a) P on yz-tasolla $\Leftrightarrow x = 6 - 3t = 0 \Leftrightarrow t = 2$

$\Rightarrow P = (6-3\cdot 2, 0+5\cdot 2, 8-2\cdot 2) = (0, 10, 4)$

b) P on xy-tasolla $\Leftrightarrow z = 8 - 2t = 0 \Leftrightarrow t = 4$

$\Rightarrow P = (6-3\cdot 4, 0+5\cdot 4, 8-2\cdot 4) = (-6, 20, 0)$

6.17



$A = (5,5,0)$, $B = (2,3,6)$

$\overline{AB} = -3\vec{i} - 2\vec{j} + 6\vec{k}$

P on suoralla $\Leftrightarrow \overline{AP} \parallel \overline{AB} \Rightarrow \overline{AP} = t\overline{AB} = -3t\vec{i} - 2t\vec{j} + 6t\vec{k}$

$\Rightarrow P = (5-3t, 5-2t, 0+6t)$

a) P on y-akselin suuntaisella $\Leftrightarrow yz$-tasolla

$\Leftrightarrow x = 5 - 3t = 0 \Leftrightarrow t = \frac{5}{3}$

$\Rightarrow P = (5 - 3\cdot\frac{5}{3}, 5 - 2\cdot\frac{5}{3}, 0 + 6\cdot\frac{5}{3}) = (0, \frac{5}{3}, 10)$

$\Rightarrow$ korkeus: $z = 10$

b) P on x-akselin suuntaisella $\Leftrightarrow xz$-tasolla

$\Leftrightarrow y = 5 - 2t = 0 \Leftrightarrow t = \frac{5}{2}$

$\Rightarrow P = (5 - 3\cdot\frac{5}{2}, 5 - 2\cdot\frac{5}{2}, 0 + 6\cdot\frac{5}{2}) = (-\frac{5}{2}, 0, 15)$

$\Rightarrow$ korkeus: $z = 15$