10.4.15

Øvt 11

1

$(1,2,3)$ $\quad 2\vec{i}-3\vec{j}-4\vec{k}=\vec{v}$

P_0 $\quad \vec{r}_0=\vec{i}+2\vec{j}+3\vec{k}$

Vektor-parameterform:

$$\vec{r}=\vec{r}_0+t\cdot\vec{v}$$

$$\vec{r}=\vec{i}+2\vec{j}+3\vec{k}+t\cdot(2\vec{i}-3\vec{j}-4\vec{k})$$

Skalar-parameterform:

$$\begin{cases} x = x_0+at \\ y = y_0+bt \\ z = z_0+ct \end{cases} = \begin{cases} x=1+2t \\ y=2-3t \\ z=3-4t \end{cases}$$

Standardform:

$$\frac{x-x_0}{a}=\frac{y-y_0}{b}=\frac{z-z_0}{c}$$

$$\frac{x-1}{2}=\frac{y-2}{-3}=\frac{z-3}{-4}$$

10.4.29 Øut 11

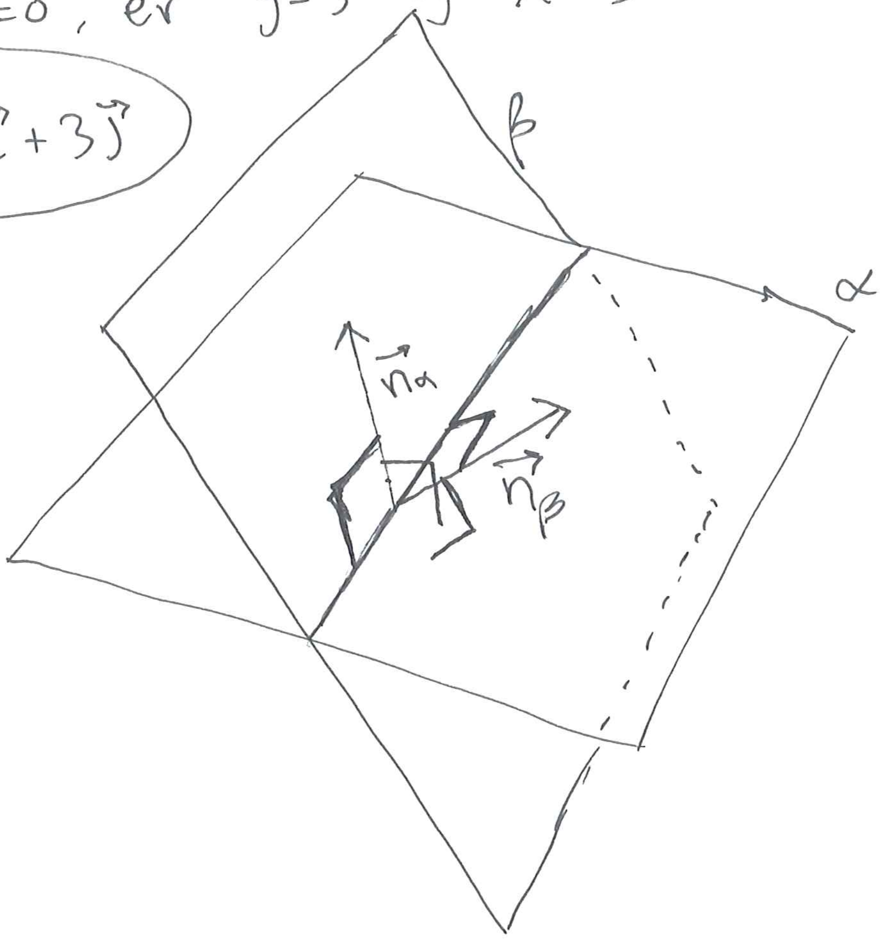
2

$$L_1: \begin{cases} x+2y=3 & \leftarrow \alpha \\ y+2z=3 & \leftarrow \beta \end{cases} \quad L_2: \begin{cases} x+y+z=6 \\ x-2z=-5 \end{cases}$$

$\vec{r}_1$ $\quad \vec{r}_2 \quad \vec{v}_1 \quad \vec{v}_2$

L_1: Når $z=0$, er $y=3$ og $x=-3$

$\vec{r}_1 = -3\vec{i}+3\vec{j}$



$$\vec{v}_1 = (\vec{i}+2\vec{j})\times(\vec{j}+2\vec{k})$$

$$= \begin{bmatrix} 2 & & 0 & & 1 & & 2 \\ & \times & & \times & & \times & \\ 1 & & 2 & & 0 & & 1 \end{bmatrix} = 4\vec{i}-2\vec{j}+\vec{k} = \vec{v}_1$$

Øvt 11

3

$L_2: \ z = 0 \Rightarrow x = -5$ og $y = 11$

$\vec{r}_2 = -5\vec{i} + 11\vec{j}$

$\vec{v}_2 = (\vec{i} + \vec{j} + \vec{k}) \times (\vec{i} - 2\vec{k})$

$$= \begin{bmatrix} 1 & & 1 & & 1 & & 1 \\ & \times & & \times & & \times & \\ 0 & & -2 & & 1 & & 0 \end{bmatrix} = -2\vec{i} + 3\vec{j} - \vec{k} = \vec{v}_2$$

$$s = \frac{|(\vec{r}_2 - \vec{r}_1) \cdot (\vec{v}_1 \times \vec{v}_2)|}{|\vec{v}_1 \times \vec{v}_2|}$$

$$\left(\vec{r}_1 - \vec{r}_2 = -3\vec{i} + 3\vec{j} - (-5\vec{i} + 11\vec{j}) = 2\vec{i} - 8\vec{j}\right)$$

$\Downarrow$

$\vec{v}_1 \times \vec{v}_2 = (4\vec{i} - 2\vec{j} + \vec{k}) \times (-2\vec{i} + 3\vec{j} - \vec{k})$ $\quad \boxed{\vec{r}_2 - \vec{r}_1 = -2\vec{i} + 8\vec{j}}$

$$\begin{bmatrix} -2 & & 1 & & 4 & & -2 \\ & \times & & \times & & \times & \\ 3 & & -1 & & -2 & & 3 \end{bmatrix} = -\vec{i} + 2\vec{j} + 8\vec{k}$$

$$(\vec{r}_2 - \vec{r}_1) \cdot (\vec{v}_1 \times \vec{v}_2) = (-2\vec{i} + 8\vec{j}) \cdot (-\vec{i} + 2\vec{j} + 8\vec{k})$$

$$= 2 + 16 = 18$$

$r_1 - r_2$

$$-2 - 16 = -18$$

Out 11

$$|\vec{V}_1 \times \vec{V}_2| = \sqrt{1^2+2^2+8^2} = \sqrt{69}$$

4

$$S = \frac{18}{\sqrt{69}}$$