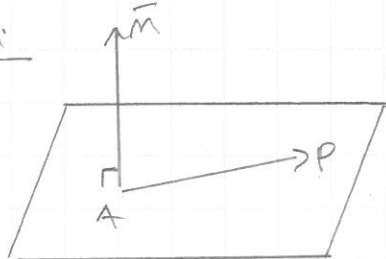


yhteisesti:



Tason normaali-vektori: $\vec{n} = a\vec{i} + b\vec{j} + c\vec{k}$

Tason piste $A = (x_0, y_0, z_0)$

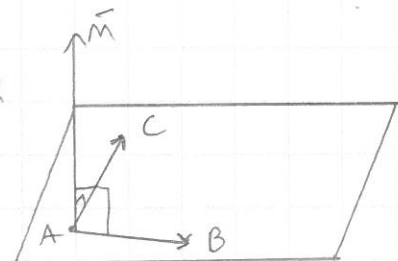
Tason yleinen piste $P = (x, y, z)$

$\Rightarrow$ tason yhtälö:

$$\vec{n} \cdot \vec{AP} = a(x - x_0) + b(y - y_0) + c(z - z_0) = 0$$

$$\Leftrightarrow \underline{ax + by + cz + d = 0} \quad (\text{tason normaali-vektori})$$

8.12



$$A = (4, 0, 2), B = (-2, 1, 0), C = (0, 5, 0)$$

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

$$\vec{AC} = -4\vec{i} + 5\vec{j} - 2\vec{k}$$

$$\vec{n} = \vec{AB} \times \vec{AC} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -6 & 1 & -2 \\ -4 & 5 & -2 \end{vmatrix} = 8\vec{i} - 4\vec{j} - 26\vec{k}$$

$$\Rightarrow \text{taso: } 8x - 4y - 26z + d = 0$$

$$C = (0, 5, 0) \text{ on tasolla: } 8 \cdot 0 - 4 \cdot 5 - 26 \cdot 0 + d = 0 \quad \Leftrightarrow d = 20$$

$$\Rightarrow \underline{8x - 4y - 26z + 20 = 0}$$

$$D = (x, 0, 0): 8x + 20 = 0 \quad \Leftrightarrow x = -\frac{5}{2} \Rightarrow \underline{D = (-\frac{5}{2}, 0, 0)}$$

$$\Gamma_{TA1}: ax + by + cz + d = 0$$

$|: d \neq 0$ (olet. että taso ei kulje origon kautta)

$$\Leftrightarrow \underbrace{\frac{a}{d}}_e x + \underbrace{\frac{b}{d}}_f y + \underbrace{\frac{c}{d}}_g z + 1 = 0$$

$$\left\{ \begin{array}{l} A = (4, 0, 2) \text{ on tasolla: } 4e + 2g + 1 = 0 \\ B = (-2, 1, 0) \text{ ---: } -2e + f + 1 = 0 \\ C = (0, 5, 0) \text{ ---: } 5f + 1 = 0 \end{array} \right.$$

$$B = (-2, 1, 0) \text{ ---: } -2e + f + 1 = 0$$

$$C = (0, 5, 0) \text{ ---: } 5f + 1 = 0 \quad \Leftrightarrow f = -\frac{1}{5}$$

$$-2e - \frac{1}{5} + 1 = 0 \quad \Leftrightarrow e = \frac{2}{5}$$

$$4 \cdot \frac{2}{5} + 2g + 1 = 0 \quad \Leftrightarrow g = -\frac{13}{10}$$

$$\Rightarrow \frac{2}{5}x - \frac{1}{5}y - \frac{13}{10}z + 1 = 0 \quad | \cdot 20$$

$$\Leftrightarrow \underline{8x - 4y - 26z + 20 = 0}$$