



$$d \cap \pi: 2(x_0 + k a) + b(y_0 + k b) + c(z_0 + k c) + d = 0$$

$$2x_0 + by_0 + cz_0 + d + k(2^2 + b^2 + c^2) = 0$$

$$k = - \frac{2x_0 + by_0 + cz_0 + d}{2^2 + b^2 + c^2}$$

$$I = \begin{pmatrix} x_0 - 2 \cdot \frac{2x_0 + by_0 + cz_0 + d}{2^2 + b^2 + c^2} \\ y_0 - b \cdot \frac{2x_0 + by_0 + cz_0 + d}{2^2 + b^2 + c^2} \\ z_0 - c \cdot \frac{2x_0 + by_0 + cz_0 + d}{2^2 + b^2 + c^2} \end{pmatrix}$$

$$\vec{PI} = k \cdot \begin{pmatrix} a \\ b \\ c \end{pmatrix} = \frac{ax_0 + by_0 + cz_0 + d}{a^2 + b^2 + c^2}$$

$$\begin{aligned} \|\vec{PI}\| &= |k| \cdot \sqrt{a^2 + b^2 + c^2} \\ &= \frac{|ax_0 + by_0 + cz_0 + d|}{\sqrt{a^2 + b^2 + c^2}} \end{aligned}$$