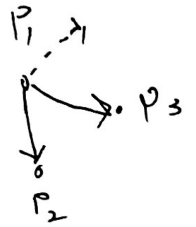
Given p_1, p_2, p_3 &

$\vec{n} = (p_2 - p_1) \times (p_3 - p_1)$

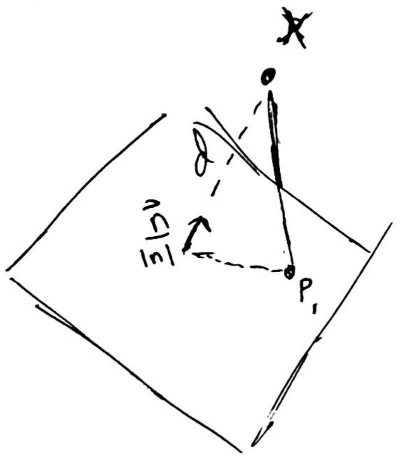


Let $n = \begin{bmatrix} A \\ B \\ C \end{bmatrix}$

Then a point $\vec{x} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ is on the plane perpendicular to $\vec{n}$ that passes through p_1

if $(\vec{x} - \vec{p}_1) \cdot \vec{n} = \vec{0}$ which is:

$$A(x - p_{1x}) + B(y - p_{1y}) + C(z - p_{1z}) = Ap_{1x} + Bp_{1y} + Cp_{1z}$$
$$= D$$



Let $\vec{a} = x - p_1$

Let $p_1 = \begin{bmatrix} x_0 \\ y_0 \\ z_0 \end{bmatrix}$

Let $x = \begin{bmatrix} x_1 \\ y_1 \\ z_1 \end{bmatrix}$

$$d = \left| \vec{a} \cdot \frac{\vec{n}}{|n|} \right|$$

$$= \frac{|A(x_1 - x_0) + B(y_1 - y_0) + C(z_1 - z_0)|}{\sqrt{A^2 + B^2 + C^2}}$$

$$= \frac{Ax_1 + By_1 + Cz_1 - D}{\sqrt{A^2 + B^2 + C^2}}$$