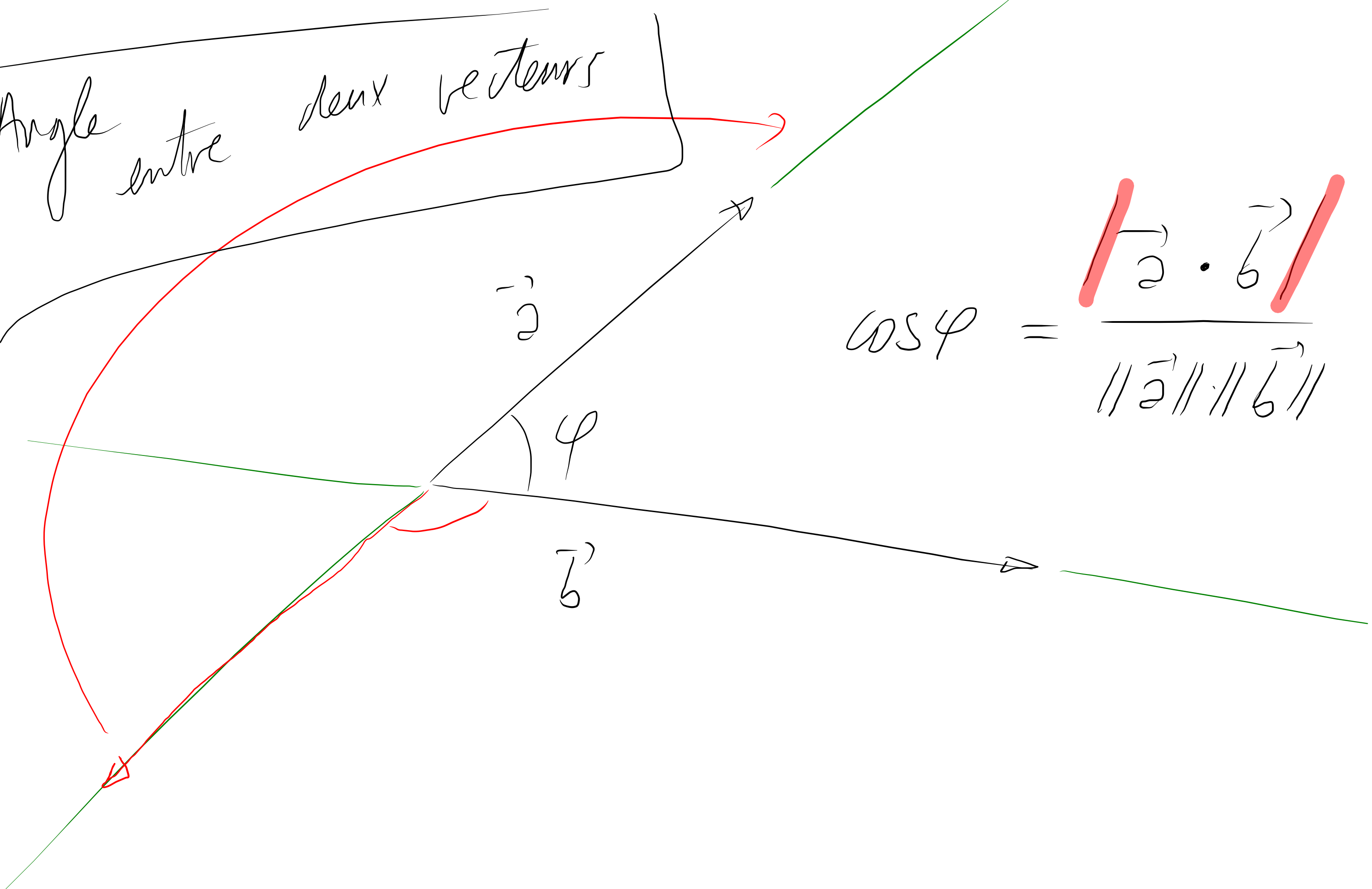


Angle entre deux vecteurs



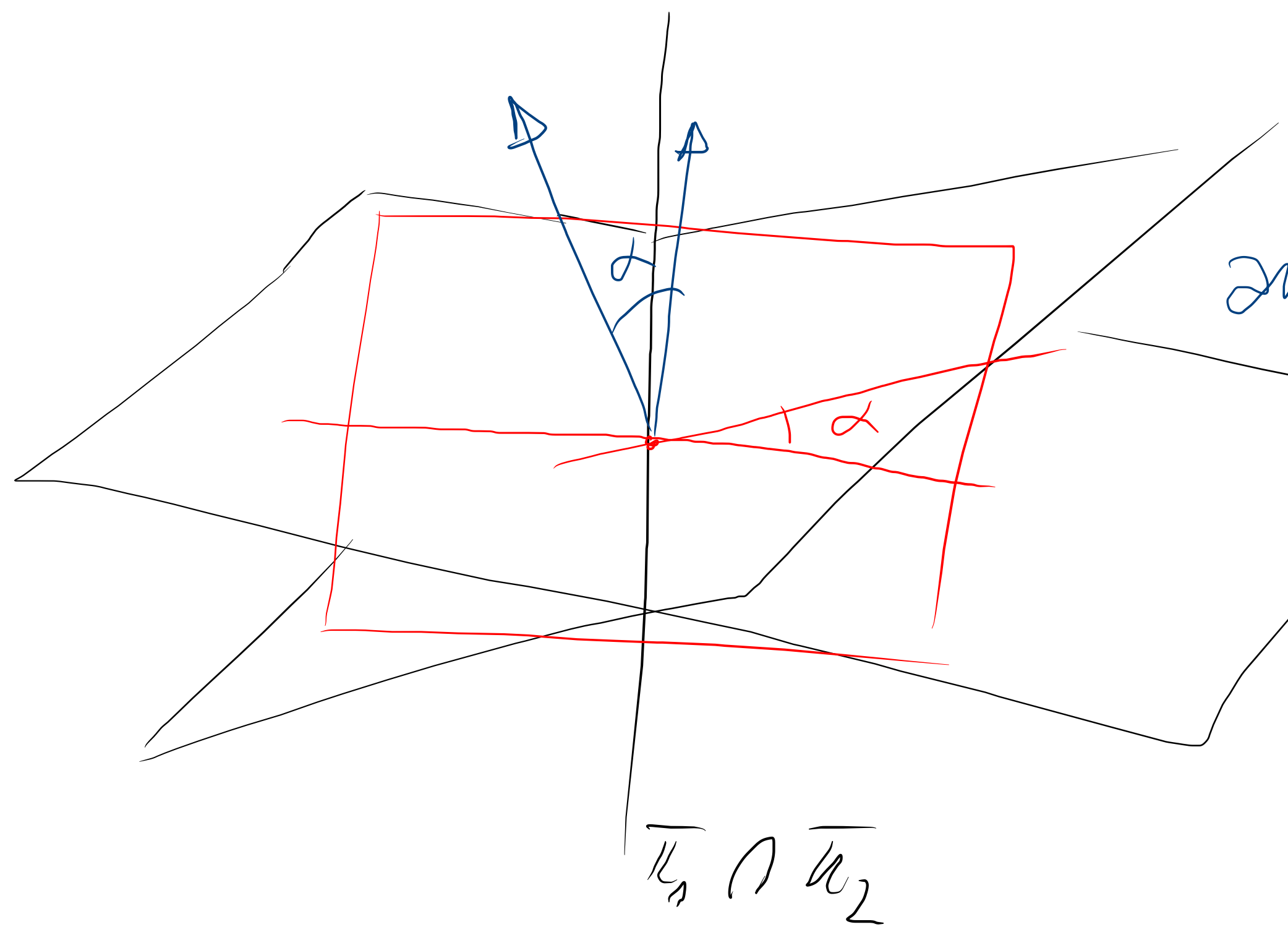
$$\cos \varphi = \frac{|\vec{a} \cdot \vec{b}|}{\|\vec{a}\| \cdot \|\vec{b}\|}$$

Angle entre 2 plans

$$n_1 \perp \pi_1$$

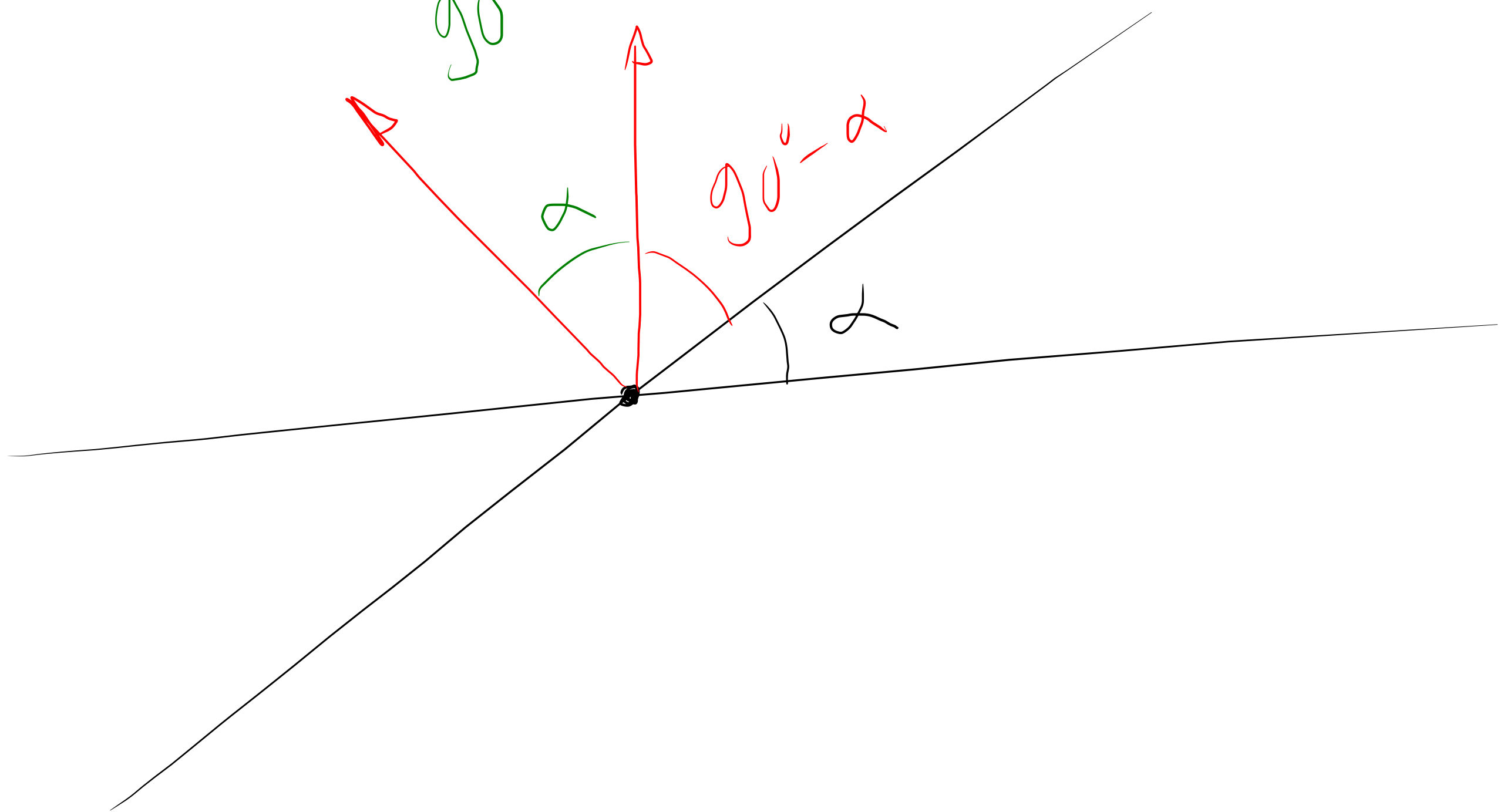
$$n_2 \perp \pi_2$$

angle (π_1, π_2)



$$\frac{|n_1 \cdot n_2|}{\|n_1\| \cdot \|n_2\|}$$

$$g_{0^0} - (g_{0^0} - \alpha) = \alpha$$



Example:

π_1

$$x + y + z = 0$$

\vec{n}_1

$$= \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

π_2

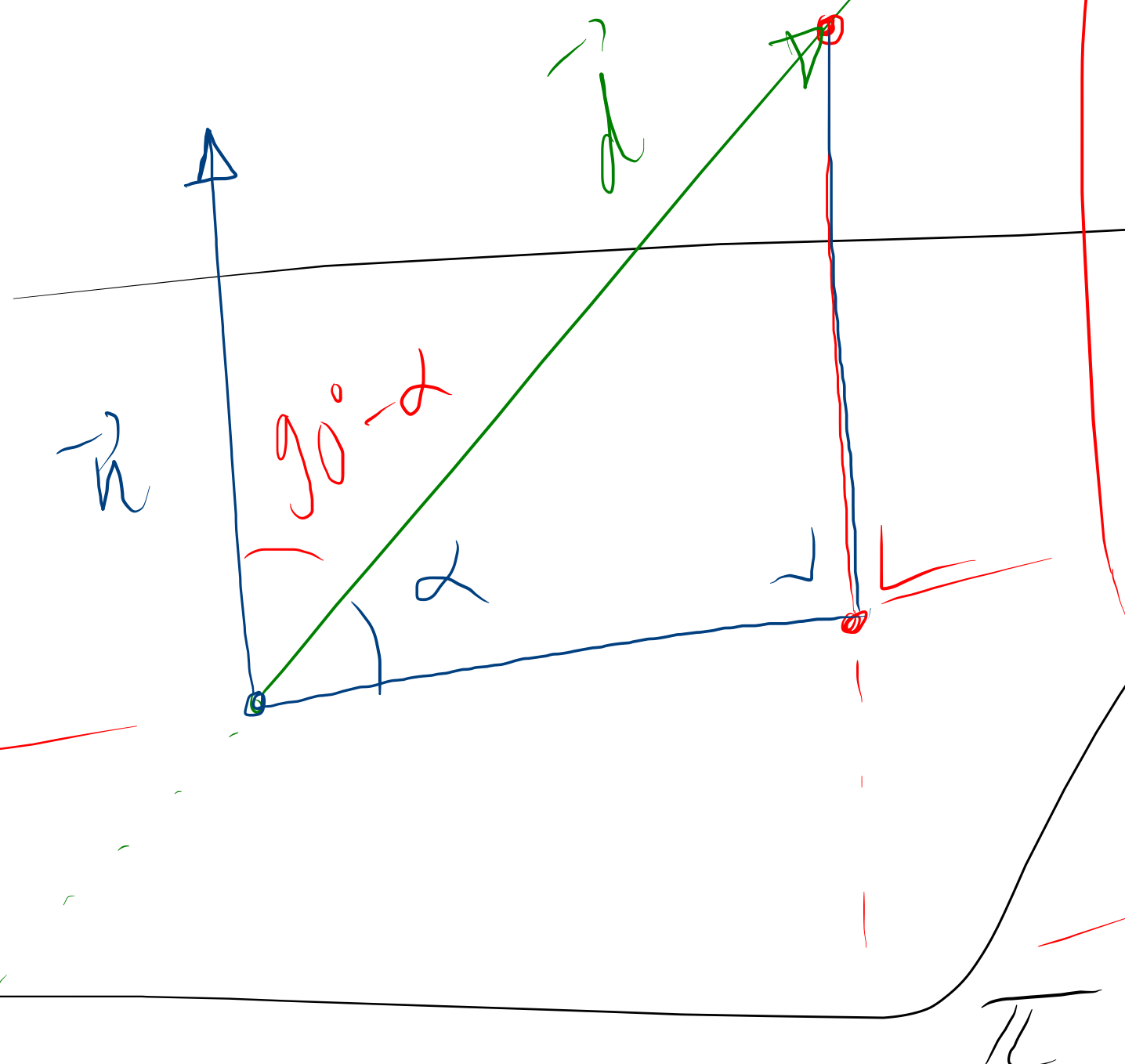
$$-x + 2y - 3z + 4 = 0$$

\vec{n}_2

$$= \begin{pmatrix} -1 \\ 2 \\ -3 \end{pmatrix}$$

$$\cos \alpha = \frac{|-1 + 2 - 3|}{\sqrt{3} \cdot \sqrt{14}} = \frac{2}{\sqrt{42}} \approx 72^\circ$$

Angle entre
une droite
et un
plan



$$\varphi = 90^\circ - \alpha$$

$$\cos \varphi = \frac{|\vec{n} \cdot \vec{d}|}{\|\vec{n}\| \|\vec{d}\|}$$

Example

$$\vec{d} = \begin{pmatrix} 2,39 \\ 5,65 \\ 3,67 \end{pmatrix}$$

$$\vec{n} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

$$\varphi = 90^\circ - \alpha$$

$$\cos \varphi = \frac{2,39 + 5,65 + 3,67}{\sqrt{3} \sqrt{2,39^2 + 5,65^2 + 3,67^2}} = \frac{11,71}{12,38}$$

$$\approx 0,945$$

$$\approx 18,96^\circ$$

$$\approx 19^\circ$$

$$\Rightarrow \alpha \stackrel{!}{=} 71^\circ$$