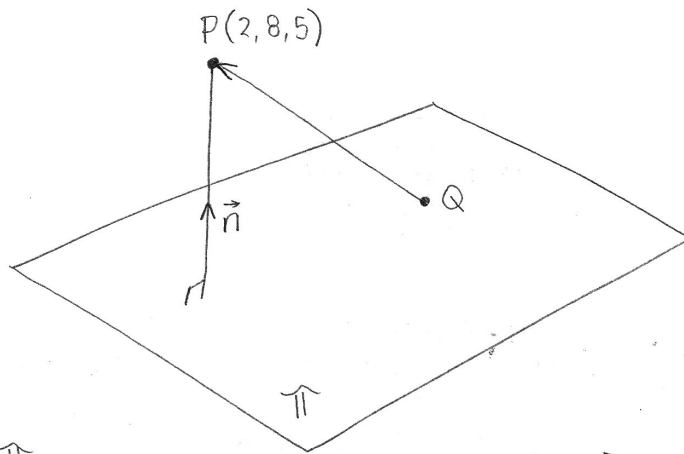


Ejercicio 10 | Geometría vectorial

Distancia de $P(2, 8, 5)$ al plano $x - 2y - 2z = 1$.



Punto $Q \in \pi$

$$x - 2y - 2z = 1,$$

Para $x=0 \wedge y=0$

$$-2z = 1$$

$$\boxed{z = -1/2}$$

Comprobamos $Q(0, 0, -1/2)$

$$(0) - 2(0) - 2\left(-\frac{1}{2}\right) = 1.$$

$$\underbrace{1}_{Q \in \pi} = 1.$$

$$\text{Halla } \text{Proy}_{\vec{n}} \vec{QP} = \left(\frac{\vec{n} \cdot \vec{QP}}{\|\vec{n}\| \|\vec{n}\|} \right) \vec{n} \quad (*)$$

$$\vec{QP} = \begin{bmatrix} 2-0 \\ 8-0 \\ 5-(-1/2) \end{bmatrix} = \begin{bmatrix} 2 \\ 8 \\ \frac{10}{2} + \frac{1}{2} \end{bmatrix} = \begin{bmatrix} 2 \\ 8 \\ 11/2 \end{bmatrix} \quad (1)$$

$$\vec{n} = \begin{bmatrix} 1 \\ -2 \\ -2 \end{bmatrix}, \quad \|\vec{n}\| = \sqrt{1+4+4} = \sqrt{9}$$

$$\boxed{\|\vec{n}\| = 3} \quad (2)$$

$$\vec{n} \cdot \vec{QP} = 2 - 16 - 11 = -25. \quad (3)$$

(3) y (2) en (*)

$$\text{Proy}_{\vec{n}} \vec{QP} = \left(\frac{-25}{9} \right) \begin{bmatrix} 1 \\ -2 \\ -2 \end{bmatrix} = \begin{bmatrix} -\frac{25}{9} \\ \frac{50}{9} \\ \frac{50}{9} \end{bmatrix}$$

$$\|\text{Proy}_{\vec{n}} \vec{QP}\| = \sqrt{\frac{25^2}{9^2} + \frac{50^2}{9^2} + \frac{50^2}{9^2}}$$

$$= \sqrt{\frac{5625}{81}} = \sqrt{\frac{625}{9}} = \frac{25}{3}$$

$$= \boxed{8,33}$$