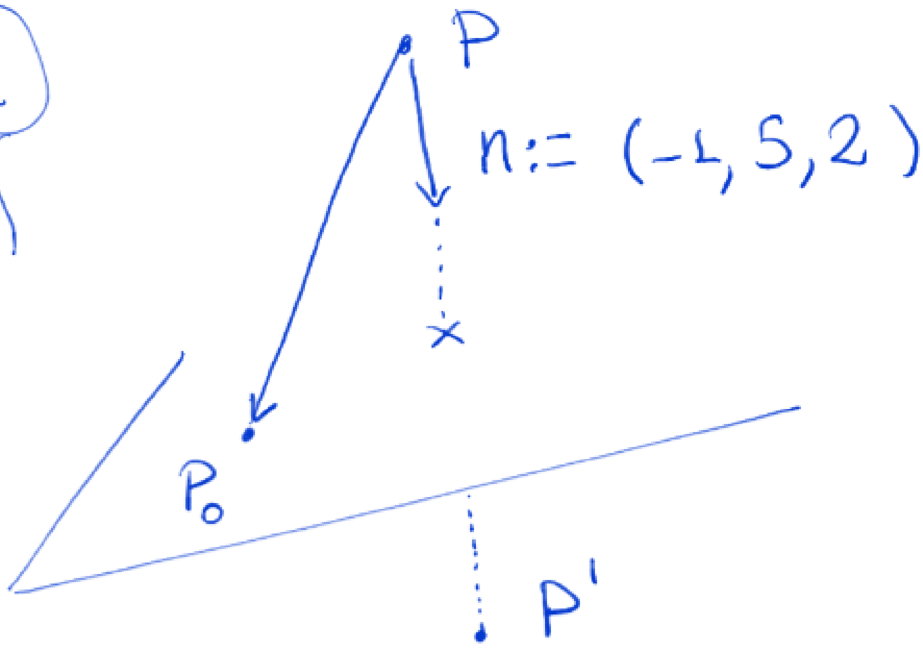
1



Let P' be the such reflexion; then

$$P' = P + 2 \cdot \frac{|\langle P_0 - P, n\rangle|}{\|n\|} \cdot \frac{n}{\|n\|}$$

$$= P + \frac{2|\langle (1,-3,4), n\rangle|}{\|n\|^2} \cdot n$$

$$= P + \frac{2 \cdot 8}{30} \cdot n$$

$$= (2,-1,3) + (-8/15, 8/3, 16/15)$$

$$= (22/15, 5/3, 61/15)$$

2 Let $u := (a_x, a_y, a_z) := \frac{\sqrt{3}}{3}(1,1,1)$

and $\theta := -2\pi/3$

) with $\theta := -2\pi/3$.

Then, from expressions (4.19) of Janke,

$$M_{rot} = \cos(\theta)\cdot I + (1-\cos(\theta))\cdot u\cdot u^T$$

$$+ \sin(\theta)\cdot \begin{bmatrix} 0 & -a_z & a_y \\ a_z & 0 & -a_x \\ -a_y & a_x & 0 \end{bmatrix}$$

$$= -\frac{1}{2}\cdot I + \frac{1}{2}\cdot \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix} + \frac{1}{2}\begin{bmatrix} 0 & -1 & 1 \\ 1 & 0 & -1 \\ -1 & 1 & 0 \end{bmatrix}$$

$$= \begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$$

Finally,

$$T(1,0,0) = (0,1,0)$$

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$\boxed{13}$