

TEMA 6 2ºA

① $A(-3, 1, 4) \quad \pi: 2x + 3y - z - 2 = 0$

$\vec{n}(2, 3, -1) = \vec{v}_r$

$r: \begin{cases} x = -3 + 2\lambda \\ y = 1 + 3\lambda \\ z = -4 - \lambda \end{cases}$

$2(-3+2\lambda) + 3(1+3\lambda) - (-4-\lambda) - 2 = 0$
 $-6 + 4\lambda + 3 + 9\lambda + 4 + \lambda - 2 = 0$
 $14\lambda - 1 = 0$
 $\lambda = \frac{1}{14}$

$Q\left(\frac{-20}{7}, \frac{17}{14}, \frac{-57}{14}\right)$

$A' \left(\frac{-3+x}{2}, \frac{1+y}{2}, \frac{-4+z}{2} \right) = \left(\frac{-20}{7}, \frac{17}{14}, \frac{-57}{14} \right) \Rightarrow A': \left(\frac{-19}{7}, \frac{10}{7}, \frac{-29}{7} \right)$

Respecto a $r: x-1 = \frac{y+2}{-3} = \frac{z-1}{5} \quad \vec{v}_r(1, -3, 5) = \vec{n}$

$x - 3y + 5z + D = 0 \rightarrow -3 - 3 - 20 + D = 0 \rightarrow D = 26$

$\pi: x - 3y + 5z + 26 = 0$

$\begin{cases} x = 1 + \lambda \\ y = -2 - 3\lambda \\ z = 1 + 5\lambda \end{cases}$

$1 + \lambda - 3(-2 - 3\lambda) + 5(1 + 5\lambda) + 26 = 0$
 $1 + \lambda + 6 + 9\lambda + 5 + 25\lambda + 26 = 0$
 $35\lambda + 38 = 0 \quad \lambda = \frac{-38}{35}$

$Q\left(-\frac{9}{35}, \frac{44}{35}, \frac{-31}{7}\right)$

$A' \left(\frac{-3+x}{2}, \frac{1+y}{2}, \frac{-4+z}{2} \right) = \left(\frac{-3}{35}, \frac{44}{35}, \frac{-31}{7} \right) \Rightarrow A' \left(\frac{99}{35}, \frac{53}{35}, \frac{-34}{7} \right)$

②

$r: \begin{cases} x = 2 - \lambda \\ y = 1 + 2\lambda \\ z = -3\lambda \end{cases}$

$\vec{v}_r(-1, 2, -3)$
 $R(2, 1, 0)$

$\pi: 3x - y + 2z - 1 = 0$
 $\vec{n}(3, -1, 2)$

$\begin{vmatrix} x-2 & y-1 & z \\ -1 & 2 & -3 \\ 3 & -1 & 2 \end{vmatrix} = 0$

$4(x-2) - 9(y-1) + z - 6z - 3(x-2) + 2(y-1) = 0$
 $(x-2) - 7(y-1) - 5z = 0$
 $\pi_2: x - 7y - 5z + 5 = 0$

$\cos \alpha = \frac{|(-1, 2, -3)(3, -1, 2)|}{\sqrt{14} \cdot \sqrt{14}} = \frac{|-3 - 2 - 6|}{14} = \frac{11}{14}$

$\alpha = 38,21^\circ$
 $\beta = 90^\circ - 38,21^\circ = 51,79^\circ$

③

$r: x = \frac{y-1}{-1} = \frac{z-2}{2} \quad \vec{v}_r(1, -1, 2) \quad R(0, 1, 2)$

$s: \begin{cases} x - 3y - 5 = 0 \\ x - 3z - 8 = 0 \end{cases} \quad \begin{vmatrix} 1 & -3 & 0 \\ 1 & 0 & -3 \end{vmatrix} = (9, 3, 3) = \vec{v}_s \quad S: (5, 0, -1)$

$\begin{vmatrix} x & y-1 & z-2 \\ 1 & -1 & 2 \\ 9 & 3 & 3 \end{vmatrix} = -3x + 18(y-1) + 3(z-2) + 9(z-2) - 6x - 3(y-1) = 0$
 $-9x + 15(y-1) + 12(z-2) = 0$

$\pi: -9x + 15y + 12z - 39 = 0$

$\pi: 9x - 15y - 12z + 39 = 0 \rightarrow \pi: 3x - 5y - 4z + 13 = 0$