

$$992 \quad 5x - 2y - 2 - 3z = 0$$

$$x + 3y - 2z + 5 = 0$$

$$l = \{4, 9, 17\}$$

$$l(5x - 2y - 2 - 3z) + \mu(x + 3y - 2z + 5) = 0$$

$$x(5l + \mu) + y(-2l + 3\mu) + z(-3l - 2\mu) - 2l + 5\mu = 0$$

$$5x(2 + 3\mu) + (-12l + 24\mu) + (-12l - 34\mu) = 0$$

$$1000 \quad 1) \quad 2x + 3y - z - 4 = 0, \quad 3x - 5y + 2z + 1 = 0$$

$$\begin{cases} 2x + 3y - z - 4 = 0 \\ 3x - 5y + 2z + 1 = 0 \end{cases}$$

$$3x - 5y + 2z + 1 = 0$$

$$6y - 2z - 8 = 0$$

$$3y - z - 4 = 0$$

$$y = 2, \quad z = 2$$

$$(0, 1, 1)$$

1002

$$1) \quad \frac{x}{1} = \frac{y-1}{-1} = \frac{z}{3}$$

l_1

$$3x - 5y + 2z + 1 = 0$$

$$3x + y - 5z + 2 = 0, \quad 2x + 3y - 8z + 3 = 0$$

l_2

$$a_1 = \{1, -1, 3\}$$

$$n_1 = \{3, -5, 2\}$$

$$n_2 = \{2, 3, -8\}$$

$$a_2 \parallel [a_1 n_1] = \{4, 1, 4\}$$

$$(a_2 \cdot \{1, 2, 1\})$$

$$a_2 \cdot a_1 = 1 + 2(-1) + 3 = 2 \neq 0$$

$$\perp \rightarrow l_1 \perp l_2$$

$$2) \quad x = 2t, \quad y = 3t - 2, \quad z = -6t + 1 \quad \perp \quad 2x - y - 5z + 4 = 0, \quad 1x - y - 5z + 4 = 0$$

l_1

l_2

$$a_1 = \{2, 3, -6\}$$

$$n_1 = \{2, 1, -1\}$$

$$n_2 = \{1, -1, -5\}$$

$$a_1 \parallel [n_1, m_1] = \{-9, -6, -6\}, a_2 = \{3, 2, 2\}$$

$$a_1 \cdot a_2 = 2 \cdot 3 + 3 \cdot 2 + 2 \cdot 2 = 20 \rightarrow l_1 \perp l_2$$

$$3) \underbrace{x+y-3z-5=0, 2x-y-9z+2=0}_{n_1} \perp \underbrace{4x+y+2z=0, 2x-y-2z=0}_{n_2}$$

$$n_1 = \{1, 1, -3\}$$

$$n_2 = \{2, 1, 2\}$$

$$n_1 = \{2, -1, -3\}$$

$$n_2 = \{1, -2, -1\}$$

$$a_1 \parallel [n_1, n_2] = \{1, 3, -3\}$$

$$a_2 \parallel [n_1, n_2] = \{5, 6, 6\}$$

$$a_1 = \{1, 3, -3\}$$

$$a_2 = \{1, 2, -2\}$$

$$a_1 \cdot a_2 = 1 + 6 - 6 = 1 \rightarrow l_1 \perp l_2$$

$$\text{W22} \quad \frac{x+2}{2} = \frac{y}{-3} = \frac{z-1}{4}, \quad \frac{x-3}{6} = \frac{y-1}{4} = \frac{z-2}{2}, \quad l_1 \perp l_2$$

$$x = 2t$$

$$x = 6s$$

$$y = -3t$$

$$y = 4s$$

$$z = 4t + 1$$

$$z = 2s + 2$$

$$\begin{cases} -3t = 4s \\ 2t = 4s + 1 \end{cases}$$

$$11t = 2s$$

$$11t = 11$$

$$t = 1$$

$$s = -\frac{y}{4} = 1$$

$$z = 5$$

$$l_2 = 3$$

1034 $x = 3t, y = -4t, z = 5t$

$x = 6t, y = 4t, z = -6t$

$$\begin{cases} 3t + 2t = 4 \\ 3t + 4t = -6t - 12 \end{cases}$$

$$\begin{cases} 6t = 0 \\ 6t = -\frac{4}{3} \end{cases}$$

$x = 0$

$y = \frac{4}{3}$

$z = 0$

$\frac{4}{3} = 4 = \frac{12}{3}$

$n_2 = \{3, 4, 3\}$

$n_2 = \{4, 3, -1\}$

$\text{all } [n_i, n_j] = \{1, 5, 8\} = \text{all } \{(-1, 1, 4, 3)\}$

$x = -2t - 11$

$y = 3t + \frac{20}{3}$

$z = 4t$

1046

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

$4x - 3y + 4z + 1 = 0$

$\parallel 2x - y + 6z - 2 = 0?$

$$\begin{cases} 3x - 2y + z + 3 = 0 \\ 4x - 3y + 4z + 1 = 0 \end{cases}$$

$$\begin{vmatrix} 3 & -2 & 1 \\ 4 & -3 & 4 \end{vmatrix}$$

~~$n_1 = \{1, 2, 3\}$~~

$n_1 = \{5, 1, 2\}$

$n_1 = \{2, 1, 1\}$

$n_1 = a \rightarrow \{1, 1\}$

$-10 + 8 - 6 = -8$

1061 $2x + y - 2z = 10$

$x - y - 2z = 2$

$\frac{x+2}{3}, \frac{y-5}{2}, \frac{z-9}{4}$

$(a_1, a_2, a_3) = \{-3, 1, 1\}$

$\tilde{a}_1 = \{-3, 1, 1\}$

$\tilde{a}_2 = \{3, -1, -1\} \rightarrow L_2 \parallel L_1$

$L_1 \begin{cases} 2x + y - 2z = 10 \\ x - y - 2z = 2 \end{cases}$

$L_2 \begin{cases} \frac{x+2}{3} = \frac{y-5}{2} = \frac{z-9}{4} \Rightarrow y=0, x=8, z=28 \\ (8, 0, 28) \end{cases}$

$-3(x-8) + 1(y-0) - 1(z-28) = 0$

$-3x + 14y - 4z + 116 = 0$

$\begin{cases} -3x + 14y - 4z + 116 = 0 \\ 2x + y - 2z = 10 \\ x - y - 2z = 2 \end{cases}$

$x=24, y=-12, z=14$

$d = \sqrt{16+14+16} = \sqrt{46} \approx 6.78$

1075 Q-7 $P(B_1, A_1) = 6$

$M_1(-6, 1; -5)$

$M_2(7, -2; 1)$

$M_3(10, -7; 3)$

$\begin{vmatrix} x+6 & y-1 & z+5 \\ 13 & -3 & 4 \\ 16 & -8 & 6 \end{vmatrix}$

$= (x+6)18 + (y-1)64 - (z+5)104 + 48(z+5) - 288(y-1) + 32(16)$

$$\begin{cases} x = 6t-3 \\ y = -4t-6 \\ z = -4t-6 \end{cases}$$

$$L_1: (1, -3, -2)$$

$$P \vec{K} = \{ -1, 1, 4 \}$$

$$L_2: (1, -2, 2)$$

$$\text{1083(2)} \begin{cases} x = 2t-4 \\ y = -6t-4 \\ z = -2t-5 \end{cases}$$

$$\begin{cases} x = 4t-8 \\ y = -3t-5 \\ z = -5t-5 \end{cases}$$

$$a_1(2) = \{ -1, 2 \}$$

$$a_2 \{ 4, -2, -5 \}$$

$$\vec{n} = \{ -1, 2, -2 \}$$

$$-1(x+1) + 2(y-1) - 2(z+1) = 0$$

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

$$\mu = \frac{1}{\sqrt{9}} = \frac{1}{3}$$

$$-\frac{x}{3} + \frac{2y}{3} - \frac{2z}{3} - \frac{4}{3} = 0$$

$$d = \left| \frac{0}{3} + \frac{10}{3} + \left(-\frac{10}{3} \right) - \frac{4}{3} \right| = 3$$

