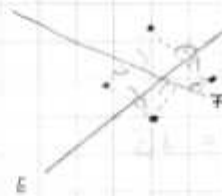


S. 306 Nr. 4

$$E: 4x_2 + 3x_3 = 15$$

$$F: 6x_1 - 2x_2 + 3x_3 = 15$$



$$\vec{n}_E = \begin{pmatrix} 0 \\ 4 \\ 3 \end{pmatrix} \quad \vec{n}_F = \begin{pmatrix} 6 \\ -2 \\ 3 \end{pmatrix}$$

$$g: \vec{x} = \vec{p} + r \cdot \vec{q}$$

$$\vec{n}_E \cdot \vec{q} \stackrel{!}{=} 0 \quad \vec{n}_F \cdot \vec{q} \stackrel{!}{=} 0$$

$$1) \quad 4q_2 + 3q_3 = 0 \quad | -3q_3$$

$$2) \quad 6q_1 - 2q_2 + 3q_3 = 0$$

$$1) \quad 4q_2 = -3q_3 \quad | :4$$

$$q_2 = -\frac{3}{4}q_3$$

$$q_3 = t$$

$$q_2 = -\frac{3}{4}t$$

$$2) \quad 6q_1 + \frac{3}{2}t + 3t = 0$$

$$6q_1 + \frac{9}{2}t = 0 \quad | -\frac{9}{2}t$$

$$6q_1 = -\frac{9}{2}t \quad | :6$$

$$q_1 = -\frac{3}{4}t$$

$$\vec{q} = \begin{pmatrix} -\frac{3}{4}t \\ -\frac{3}{4}t \\ t \end{pmatrix} = t \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$$

$$q = \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$$

$$\vec{x} = \vec{p} + r \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$$

$$E: 4x_2 + 3x_3 = 15$$

$$F: 6x_1 - 2x_2 + 3x_3 = 15$$

HNF₁

$$\left| \frac{4p_2 + 3p_3 - 15}{\sqrt{4^2 + 3^2}} \right| = d \stackrel{!}{=} 3$$

$$\left| \frac{4p_2 + 3p_3 - 15}{\sqrt{25}} \right| = 3$$

$$\boxed{\left| \frac{4p_2 + 3p_3 - 15}{5} \right| = 3} \quad | \cdot 5$$

$$\begin{aligned} \textcircled{1} \quad 4p_2 + 3p_3 - 15 &= 15 \quad | +15 \\ 4p_2 + 3p_3 &= 30 \quad | -4p_2 \\ 3p_3 &= 30 - 4p_2 \end{aligned}$$

HNF₂

$$\left| \frac{6p_1 - 2p_2 + 3p_3 - 15}{\sqrt{6^2 + (-2)^2 + 3^2}} \right| = 6$$

$$\left| \frac{6p_1 - 2p_2 + 3p_3 - 15}{\sqrt{49}} \right| = 6$$

$$\boxed{\left| \frac{6p_1 - 2p_2 + 3p_3 - 15}{7} \right| = 6} \quad | \cdot 7$$

$$\begin{aligned} 6p_1 - 2p_2 + 3p_3 - 15 &= 42 \quad | +15 \\ 6p_1 - 2p_2 + 3p_3 &= 57 \end{aligned}$$

$$6p_1 - 2p_2 + 30 - 4p_2 = 57 \quad | -30$$

$$6p_1 - 6p_2 = 27 \quad | +6p_2$$

$$6p_1 = 6p_2 + 27 \quad | :6$$

$$p_1 = p_2 + 4,5$$

$$p_1 = a$$

$$p_2 = a - 4,5$$

$$3p_3 = 30 - 4p_2$$

$$3p_3 = 30 - 4a + 18$$

$$3p_3 = -4a + 48 \quad | :3$$

$$p_3 = -\frac{4}{3}a + 16$$

$$P_1(a | a - 4,5 | -\frac{4}{3}a + 16)$$

$$P_1(0 | -4,5 | 16) \quad a=0$$

$$g: \vec{x} = \begin{pmatrix} 0 \\ -4,5 \\ 16 \end{pmatrix} + r \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$$

②

HN F₁

$$\left| \frac{4p_2 + 3p_3 - 15}{5} \right| = 3$$

$$\frac{-4p_2 - 3p_3 + 15}{5} = 3 \quad | \cdot 5$$

$$-4p_2 - 3p_3 + 15 = 15 \quad | -15$$

$$-4p_2 - 3p_3 = 0 \quad | +4p_2$$

$$-3p_3 = 4p_2 \quad | : (-3)$$

$$p_3 = -\frac{4}{3}p_2$$

HN F₂

$$\left| \frac{6p_1 - 2p_2 + 3p_3 - 15}{7} \right| = 6$$

$$\frac{-6p_1 + 2p_2 - 3p_3 + 15}{7} = 6 \quad | \cdot 7$$

$$-6p_1 + 2p_2 - 3p_3 + 15 = 42 \quad | -15$$

$$-6p_1 + 2p_2 - 3p_3 = 27$$

$$-6p_1 + 2p_2 + 4p_2 = 27$$

$$-6p_1 + 6p_2 = 27 \quad | -6p_2$$

$$-6p_1 = 27 - 6p_2 \quad | : (-6)$$

$$p_1 = p_2 - 4,5$$

$$p_1 = a$$

$$p_2 = a + 4,5$$

$$p_3 = -\frac{4}{3} \cdot (a + 4,5) = -\frac{4}{3}a - 6$$

$$h: \vec{x} = \begin{pmatrix} 0 \\ 4,5 \\ -6 \end{pmatrix} + t \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$$

$$P_2(a | a + 4,5 | -\frac{4}{3}a - 6)$$

$$P_2(0 | 4,5 | -6) \quad a=0$$

③

HN7₁

$$\left| \frac{4p_2 + 3p_3 - 15}{5} \right| = 3$$

$$-4p_2 - 3p_3 + 15 = 15 \quad | -15$$

$$-4p_2 - 3p_3 = 0 \quad | +4p_2$$

$$-3p_3 = 4p_2 \quad | : (-3)$$

$$p_3 = -\frac{4}{3}p_2$$

$$p_1 = a$$

$$p_2 = a - 9,5$$

$$p_3 = -\frac{4}{3} \cdot (a - 9,5) = -\frac{4}{3}a + \frac{38}{3}$$

$$P_3 \left(a \mid a - 9,5 \mid -\frac{4}{3}a + \frac{38}{3} \right)$$

$$P_3 \left(0 \mid -9,5 \mid \frac{38}{3} \right) \quad a = 0$$

$$i: \vec{x} = \begin{pmatrix} 0 \\ -9,5 \\ \frac{38}{3} \end{pmatrix} + s \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$$

HN7₂

$$\left| \frac{6p_1 - 2p_2 + 3p_3 - 15}{7} \right| = 6$$

$$6p_1 - 2p_2 + 3p_3 - 15 = 42 \quad | +15$$

$$6p_1 - 2p_2 + 3p_3 = 57$$

$$6p_1 - 2p_2 - 4p_2 = 57$$

$$6p_1 - 6p_2 = 57 \quad | :6$$

$$p_1 = 9,5 + p_2 \quad | :6$$

$$p_1 = p_2 + 9,5$$

④ HNF₁

$$\left| \frac{4p_2 + 3p_3 - 15}{5} \right| = 3$$

$$4p_2 + 3p_3 - 15 = 15 \quad | +15$$

$$4p_2 + 3p_3 = 30 \quad | -4p_2$$

$$3p_3 = 30 - 4p_2 \quad | :3$$

$$p_3 = -\frac{4}{3}p_2 + 10$$

HNF₂

$$\left| \frac{6p_1 - 2p_2 + 3p_3 - 15}{7} \right| = 6$$

$$-6p_1 + 2p_2 - 3p_3 + 15 = 42 \quad | -15$$

$$-6p_1 + 2p_2 - 3p_3 = 27$$

$$-6p_1 + 2p_2 - 30 + 4p_2 = 27 \quad | +30$$

$$-6p_1 + 6p_2 = 57 \quad | -6p_2$$

$$-6p_1 = 57 - 6p_2 \quad | :(-6)$$

$$p_1 = p_2 - 9,5$$

$$p_1 = a$$

$$p_2 = a + 9,5$$

$$p_3 = -\frac{4}{3} \cdot (a + 9,5) + 10 = -\frac{4}{3}a - \frac{38}{3} + \frac{30}{3} = -\frac{4}{3}a - \frac{8}{3}$$

$$P_4(a \mid a + 9,5 \mid -\frac{4}{3}a - \frac{8}{3})$$

$$P_4(0 \mid 9,5 \mid -\frac{8}{3}) \quad a=0$$

$$j: \vec{x} = \begin{pmatrix} 0 \\ 9,5 \\ -\frac{8}{3} \end{pmatrix} + u \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$$

$g: \vec{x} = \begin{pmatrix} 0 \\ -4,5 \\ 16 \end{pmatrix} + r \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$	$h: \vec{x} = \begin{pmatrix} 0 \\ 4,5 \\ -6 \end{pmatrix} + t \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$
$i: \vec{x} = \begin{pmatrix} 0 \\ -9,5 \\ \frac{38}{3} \end{pmatrix} + s \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$	$j: \vec{x} = \begin{pmatrix} 0 \\ 9,5 \\ -\frac{8}{3} \end{pmatrix} + u \cdot \begin{pmatrix} 3 \\ 3 \\ -4 \end{pmatrix}$