[13-4]

#6. $(3,1,2)$. $(2,-1,5)$

$\Rightarrow P(0, y, 0)$

$$\sqrt{9+(1-y)^2+4} = \sqrt{4+(y+1)^2+25}$$

$$13+(1-y)^2 = 29+(y+1)^2$$

$$16+4y = 0 \qquad \therefore y = -4 \qquad \therefore P(0, -4, 0)$$

#13-4 Q10.

$(1, -1, 3)$. $(2, 0, -1)$. $(a, b, 3)$

$$\rightarrow \overline{P_1P_2} = (2, 0, -1) - (1, -1, 3) = (1, 1, -4)$$

$$\Rightarrow \frac{x-1}{1} = \frac{y+1}{1} = \frac{z+3}{-4} \Rightarrow \frac{a-1}{1} = \frac{b+1}{1} = \frac{6}{-4} = -\frac{3}{2}$$

$$\therefore a = -2 . \quad b = -4$$

#19. $P_1(1,3,4)$, $P_2(-2,3,7)$

$\Rightarrow \overrightarrow{P_1P_2} = \overrightarrow{OP_2} - \overrightarrow{OP_1} = (-3,0,3)$

$|\overrightarrow{P_1P_2}| = \sqrt{9+9} = 3\sqrt{2}$

$l = \pm\frac{-3}{3\sqrt{2}} = \pm\frac{-1}{\sqrt{2}}$, $m = \pm\frac{0}{3\sqrt{2}} = 0$, $n = \pm\frac{3}{3\sqrt{2}} = \pm\frac{1}{\sqrt{2}}$

Q 22. $\overrightarrow{P_1P_2} = (2,-1,-1) \Rightarrow \frac{x-1}{2} = \frac{y+1}{-1} = \frac{z-2}{-1}$

Q 24. $\begin{cases} a_1+b_1 = 6 \\ a_2+b_2 = 4 \\ a_3+b_3 = 6 \end{cases}$ $\begin{cases} a_1+c_1 = 0 \\ a_2+c_2 = 6 \\ a_3+c_3 = 8 \end{cases}$ $\begin{cases} b_1+c_1 = -2 \\ b_2+c_2 = 2 \\ b_3+c_3 = 10 \end{cases}$

$\Rightarrow \begin{cases} a_1-b_1 = 2 \\ a_2-b_2 = 4 \\ a_3-b_3 = -2 \end{cases} \Rightarrow \begin{cases} a_1 = 4 , & b_1 = 2 , & c_1 = -4 \\ a_2 = 4 & b_2 = 0 , & c_2 = 2 \\ a_3 = 2 & b_3 = 4 & c_3 = 6 \end{cases}$

$\therefore$ $P_1(4,4,2)$, $P_2(2,0,4)$, $P_3(-4,2,6)$

[13-5]

#1. $3(x-1)+2(y-3)+6(z-2)=0$

#3. $(1,2,3)$, $(-2,1,0)$, $(1,-1,2)$

$\Rightarrow \overrightarrow{P_1P_2} = (-3,-1,-3)$, $\overrightarrow{P_1P_3} = (0,-3,-1)$

$N = \overrightarrow{P_1P_2} \times \overrightarrow{P_1P_3}$

$= \begin{vmatrix} e_1 & e_2 & e_3 \\ -3 & -1 & -3 \\ 0 & -3 & -1 \end{vmatrix} = (-8,-3,9)$

$\therefore -8(x-1)-3(y-2)+9(z-3)=0$

$\frac{x-1}{2} = \frac{y}{5} = \frac{z}{7}$ 에 수직. $(4, 1, -2)$

$\Rightarrow \quad 2(x-4) + 5(y-1) + 7(z+2) = 0$

#9. $P(1, 2, 3)$. $x - y + 2z = 1$, $2x + 3y - z = 2$.

$$\Rightarrow \begin{vmatrix} x-1 & y-2 & z-3 \\ 1 & -1 & 2 \\ 2 & 3 & -1 \end{vmatrix} = (x-1)\begin{vmatrix} -1 & 2 \\ 3 & -1 \end{vmatrix} + (y-2)\begin{vmatrix} 2 & 1 \\ -1 & 2 \end{vmatrix} + (z-3)\begin{vmatrix} 1 & -1 \\ 2 & 3 \end{vmatrix}$$

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

#19. $\begin{cases} x + y + z = 1 \\ x - y - z = 5 \end{cases}$

$\Rightarrow \quad N_1 = (1, 1, 1) \quad N_2 = (1, -1, 1)$

$$\cos\theta = \frac{N_1 \cdot N_2}{|N_1| \cdot |N_2|} = \frac{1-1-1}{\sqrt{3} \cdot \sqrt{3}} = -\frac{1}{3}$$

$\therefore \theta = \cos^{-1}\left(-\frac{1}{3}\right)$