MATH 2339, HW07 : Solution

§10.5

3/. (2)

$P_0(2, 2.4, 3.5)$, $\vec{v} = 3\vec{i} + 2\vec{j} - \vec{k} = \langle 3, 2, -1 \rangle$

A vector eqn. $\vec{r} = \vec{r_0} + t\vec{v}$

$= \langle 2, 2.4, 3.5 \rangle + t\langle 3, 2, -1 \rangle$

Parametric eqs. $x = 2 + 3t,\ y = 2.4 + 2t,\ z = 3.5 - t$.

4/. (3)

$P_0(0, 14, -10)$, $\vec{v} = \langle 2, -3, 9 \rangle$

coefficients of t in the parametric eqs. of the parallel line

A vector eqn. $\vec{r} = \vec{r_0} + t\vec{v}$

$= \langle 0, 14, -10 \rangle + t\langle 2, -3, 9 \rangle$

Parametric eqs. $x = 2t,\ y = 14 - 3t,\ z = -10 + 9t$.

7/. (3)

$P_0(0, \frac{1}{2}, 1)$, $P_1 = (2, 1, -3)$, $\vec{v} = \overrightarrow{P_0P_1} = \langle 2, \frac{1}{2}, -4 \rangle$

Parametric eqs: $x = 0 + 2t,\ y = \frac{1}{2} + \frac{1}{2}t,\ z = 1 - 4t$

Symmetric eqs: $\frac{x}{2} = \frac{y - \frac{1}{2}}{\frac{1}{2}} = \frac{z - 1}{-4}$

8/. (4)

$\vec{v}$ perpendicular to $\vec{i} + \vec{j}$ and $\vec{j} + \vec{k}$.

Let $\vec{v} = \langle 1, 1, 0 \rangle \times \langle 0, 1, 1 \rangle = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 1 & 0 \\ 0 & 1 & 1 \end{vmatrix}$

$= \vec{i} - \vec{j} + \vec{k}$ $= \langle 1, -1, 1 \rangle$

$P_0(2, 1, 0)$

Parametric eqs : $\boxed{x = 2 + t,\ y = 1 - t,\ z = 0 + t}$

Symmetric eqs : $\boxed{\frac{x-2}{1} = \frac{y-1}{-1} = \frac{z}{1}}$

① [5/] $\vec{r}_0 = \langle 2, -1, 4 \rangle$, $\vec{r}_1 = \langle 4, 6, 1 \rangle$

$$\vec{r} = \vec{r}_0 + t(\vec{r}_1 - \vec{r}_0)$$

$$= \langle 2, -1, 4 \rangle + t \langle 2, 7, -3 \rangle$$