

Homework for 12.5

- 12.5, number 1: Find parametric equations for the line through the point $P = (3, -4, 1)$ parallel to the vector $\vec{v} = \vec{i} + \vec{j} + \vec{k}$.
- 12.5, number 3: Find parametric equations for the line through the points $P = (-2, 0, 3)$ and $Q = (3, 5, -2)$.
- 12.5, number 15: Give parametric equations for the line segment from $P = (1, 0, 0)$ to $Q = (1, 1, 0)$. Please draw a picture.
- 12.5, number 21: Find the equation of the plane through the point $P_0 = (0, 2, -1)$ perpendicular to $\vec{N} = 3\vec{i} - 2\vec{j} - \vec{k}$.
- 12.5, number 23: Find the equation of the plane through the points $P = (1, 1, -1)$, $Q = (2, 0, 2)$, and $R = (0, -2, 1)$.
- 12.5, number 25: Find the equation of the plane through the point $P_0 = (2, 4, 5)$ and perpendicular to the line

$$\begin{cases} x = 5 + t \\ y = 1 + 3t \\ z = 4t. \end{cases}$$

- 12.5, number 29: Find the equation of the plane which contains the two intersecting lines

$$L_1 = \begin{cases} x = -1 + t \\ y = 2 + t \\ z = 1 - t \end{cases} \quad \text{and} \quad L_2 = \begin{cases} x = 1 - 4s \\ y = 1 + 2s \\ z = 2 - 2s. \end{cases}$$

- 12.5, number 33: Find the point on the line

$$\begin{cases} x = 4t \\ y = -2t \\ z = 2t \end{cases}$$

which is closest to the point $(0, 0, 12)$.

- 12.5, number 39: Find the point on the plane $x + 2y + 2z = 13$ which is closest to the point $(2, -3, 4)$.
- 12.5, number 45: Find the distance between the planes $x + 2y + 6z = 1$ and $x + 2y + 6z = 10$.

- 12.5, number 53: Find the angle between the planes $2x + 2y + 2z = 3$ and $2x - 2y - z = 5$. (There are two angles that you might measure. You should measure the smaller of the two angles.)
- 12.5, number 57: Find the intersection of the line

$$\begin{cases} x = 1 - t \\ y = 3t \\ z = 1 + t \end{cases}$$

and the plane $2x - y + 3z = 6$.