Tutorial Worksheet

Show all your work.

1. Let ℓ be the intersection of the planes given by equations $x - y = 1$ and $x - z = 1$. Find an equation for ℓ in the form $\mathbf{r}(t) = \mathbf{r}_0 + t\mathbf{v}$.

2. A point moves in space in such a way that at time t its position is given by the vector-valued function $\mathbf{r}(t) = \langle t^2 + 1, 2t^2 - 1, 2 - 3t^2 \rangle$. At what time(s) does the point hit the plane $2x + 2y + 3z = 9$?

3. Determine the *speed* at $t = 1$ of an object whose position function is $\mathbf{r}(t) = \langle 2t^3, 3t, 3t^2 \rangle$.

4. Find an equation of the plane perpendicular to the line $x = 1 + 4t$, $y = 1 - t$, $z = -3$ passing through the point $(1, 1, 1)$.

5. Find the distance from the point $(1, -1, 1)$ to the plane $x + 2y - 2z = 6$.