

Class 4, Practice Problems

Multivariable Calculus

January 27, 2020

11.5 Parametric equations of lines

1. Find parametric equations of the line passing through the origin in $3d$ -space and parallel to $\mathbf{v} = \langle -1, 4, -1 \rangle$.
2. a) Find parametric equations of the line L passing through the point $P_1 = (-1, 0, 5)$ and $P_2 = (1, 4, 6)$.
b) Where does the line intersect the xy -plane?
3. Where does the line $\langle x, y \rangle = \langle 3t, 4t \rangle$ intersect the circle $x^2 + y^2 = 25$?
4. Find the point of intersection between the line L_1 and L_2 where
 $L_1 : x = -1 + 4t, \quad y = 3 + t, \quad z = 1$
 $L_2 : x = -13 + 12t, \quad y = 1 + \frac{7}{3}t, \quad z = -\frac{7}{2} + 3t.$

11.6 Planes

1. Find an equation of the plane:
The plane through the point $(1, -1, 1)$ and with normal vector $\mathbf{i} + \mathbf{j} - \mathbf{k}$.
2. Find an equation of the plane:
The plane through the point $(-1, 6, -5)$ and parallel to the plane $x + y + z + 2 = 0$.
3. Find parametric equations for the line through $(5, 1, 0)$ that is perpendicular to the plane $2x - y + z = 1$.