

$$x^2 + y^2 = 5 \Rightarrow f(x, y, z) = x^2 + y^2 - 5$$

$$y + z = 3 \Rightarrow g(x, y, z) = y + z - 3$$

$$f'_x = 2x \Rightarrow f'_x(1, 2, 1) = 2$$

$$f'_y = 2y \Rightarrow f'_y(1, 2, 1) = 4$$

$$f'_z = 0 \Rightarrow f'_z(1, 2, 1) = 0$$

$$g'_x = 0 \Rightarrow g'_x(1, 2, 1) = 0$$

$$g'_y = 1 \Rightarrow g'_y(1, 2, 1) = 1$$

$$g'_z = 1 \Rightarrow g'_z(1, 2, 1) = 1$$

$$\vec{U}_f = 2i + 4j + 0k$$

$$\vec{U}_g = 0i + j + k$$

$$\vec{V} = \begin{vmatrix} i & j & k \\ 2 & 4 & 0 \\ 0 & 1 & 1 \end{vmatrix}$$

$$\vec{V} = 4i - 2j + 2k$$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix} + t \cdot \begin{bmatrix} 4 \\ -2 \\ 2 \end{bmatrix}$$

$$x = 1 + 4t, \quad y = 2 - 2t, \quad z = 1 + 2t$$