

Implicit derivative

Given the equation $xy - x + 2z + e^{2z} - 2 = 0$ which implicitly defines $z = f(x, y)$ at the point $P_0 = (1; 2, 0)$, find $\frac{\partial z}{\partial x}$.

Solution

$$z'x = -\frac{F'x}{F'z} = -\frac{y-1}{2+2e^{2z}}$$

Evaluating at the point:

$$z'x = -\frac{2-1}{2+2e^0} = \frac{1}{2}$$