Implicit differentiation

$F(x,y,z) = (x+\cos x)y + yz + e^z - \pi - 1$

$F_x = y(1-\sin x)$ $F_y = (x+\cos x) + z$

$F_z = y + e^z$

$P(\frac{\pi}{2}, 2, 0)$ $F(P) = 0$

$F(x,y,z(x,y)) = 0$ for points P

$F_x(P) = 0$ $F_y(P) = \frac{\pi}{2}$ $F_z(P) = 2+1 = 3$

$F(x, y(x,z), z) = 0$ for points P

$\frac{\partial z}{\partial x}(\frac{\pi}{2}, 2) = -\frac{F_x(P)}{F_z(P)} = 0$

$\frac{\partial z}{\partial y}(\frac{\pi}{2}, 2) = -\frac{F_y(P)}{F_z(P)} = -\frac{\frac{\pi}{2}}{3} = -\frac{\pi}{6}$

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