Rudin, page 239/23: The linear approximation of $f(x, y_1, y_2)$ about the point $(0, 1, -1)$ is

$$L(x, y_1, y_2) = f(0, 1, -1) + f'(0, 1, -1) \begin{pmatrix} x \\ y_1 - 1 \\ y_2 + 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} + \begin{pmatrix} 1 & 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y_1 - 1 \\ y_2 + 1 \end{pmatrix} = x + y_2 - 1.$$

One way to restate the implicit function theorem is to say that you can locally solve $f = 0$ for some of the variables in terms of the others if you can do the same for the linear approximation. So that's we do here—we want to solve $f(x, y_1, y_2) = 0$ for x in terms of y_1 and y_2, so we replace f by L and get

$$x + y_2 - 1 = 0 \Rightarrow x = 1 - y_2,$$

where the right side is the linear approximation of the implicit function $x = g(y_1, y_2)$. In particular,

$$\frac{\partial g}{\partial y_1}(1, -1) = 0, \quad \frac{\partial g}{\partial y_2}(1, -1) = -1.$$