$= \int M_y(x,y)\,dx + g'(y) \Leftrightarrow g'(y) = N(x,y) - (c)$ (d)

$$\frac{\partial}{\partial x}\left(N(x,y) - \int M_y(x,y)\,dx\right)$$

$= N_x(x,y) - M_y(x,y) = 0$

$\therefore g(y) = \int (d)\,dx \quad \therefore (b), (a)$

$\psi_x(x,y) = M(x,y)$

$\psi_y(x,y) = N(x,y)$

$\begin{cases} M_y(x,y) = \psi_{xy}(x,y) \\ N_x(x,y) = \psi_{yx}(x,y) \end{cases}$

Ex. 6.4) $\underset{\substack{\| \\ M(x,y)}}{M(x)} + \underset{\substack{\| \\ N(x,y)}}{N(y)}\,\frac{dy}{dx} = 0$

$M_y(x,y) = 0$
$N_x(x,y = 0$ } é exata

Por separação: a solução de (6.3) é

$H_1(x) + H_2(y) = C$ (a)

$H_1'(x) = M(x)$

$H_2'(y) = N(y)$

Por exata:

$\psi(x,y)$ | $\psi_x = M(x,y) = M(x)$ (b)

$\psi_y = N(x,y) = N(y)$ (c)

(b) $= \psi(x,y) \int M(x)\,dx + g(y) = H_1(x) + g(y)$

(d), (c) $\Rightarrow 0 + g'(y) = N(y)$

$\psi(x,y) = H_1(x) + H_2(y) = C \therefore \psi(x,y) = C$