

How to solve an Exact ODE

$$M(x,y) dx + N(x,y) dy = 0, \text{ or } M(x,y) + N(x,y) \frac{dy}{dx} = 0.$$

$$M_y(x,y) = N_x(x,y) \text{ for all } (x,y)?$$

Yes

NO
STOP

$$\begin{aligned}\psi_x(x,y) &= M(x,y) \\ \psi_y(x,y) &= N(x,y)\end{aligned}$$

$$\psi(x,y) = C$$