Bagaimana ide kalian utk menentukan fungsi $M(x,y)$ sedemikian sehingga PD berikut mrpk PD eksak

$$M(x,y)\,dx + (2x^2y^3 + x^4y)\,dy = 0$$

$$\Downarrow \qquad\qquad \Downarrow$$

$$\frac{\partial F}{\partial x} \qquad\qquad \frac{\partial F}{\partial y}$$

PD tersebut akan menjadi PD eksak jika

$$\frac{\partial M(x,y)}{\partial y} = \frac{\partial N(x,y)}{\partial x}$$

$$\frac{\partial M(x,y)}{\partial y} = \frac{\partial (2x^2y^3 + x^4y)}{\partial x}$$

$$\frac{\partial M(x,y)}{\partial y} = 4xy^3 + 4x^3y$$

$$\int \frac{\partial M(x,y)}{\partial y} = \int 4xy^3 + 4x^3y \; \partial y$$

$$M(x,y) = xy^4 + 2x^3y^2 + \Phi(y)$$

atau ...

$$\frac{\partial F}{\partial y}(x,y)\,\partial y = 2x^2y^3 + x^4y$$

$$\int \frac{\partial F}{\partial y}(x,y)\,\partial y = \int 2x^2y^3 + x^4y \; \partial y$$

$$f(x,y) = 2x^2 \tfrac{1}{4} y^4 + x^4 \tfrac{1}{2} y^2 + \Phi(y)$$

$$\frac{\partial F(x,y)}{\partial x} = 4x \tfrac{1}{4} y^4 + 4x^3 \tfrac{1}{2} y^2 + \Phi'(y) = M(x,y)$$

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$M(x,y) = xy^4 + 2x^3y^2 + \phi'(y)$

Jadi, fungsi $M(x,y) = xy^4 + 2x^3y^2 + \phi(y)$