

Salah satu PD disebut PD eksak jika $\frac{\partial M(x,y)}{\partial y} = \frac{\partial N(x,y)}{\partial x}$ dimana $M(x,y) = \frac{\partial F}{\partial x}$ dan $N(x,y) = \frac{\partial F}{\partial y}$.

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

maka dari persamaan tersebut diperoleh

$$N(x,y) = 2x^2y^3 + x^4y$$

$$\begin{aligned}\text{dan } f(x,y) &= \int (2x^2y^3 + x^4y) dy \\ &= \frac{1}{2}x^2y^4 + \frac{1}{2}x^4y^2 + \Phi(x)\end{aligned}$$

Kemudian $f(x,y)$ diturunkan secara Parsial terhadap x untuk mendapatkan persamaan $M(x,y)$

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

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

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

terbukti bahwa PD $(xy^4 + 2x^3y^2 + \Phi'(x))dx + (2x^2y^3 + x^4y)dy$ memenuhi syarat PD eksak $\frac{\partial M(x,y)}{\partial y} = \frac{\partial N(x,y)}{\partial x}$
Sehingga fungsi $M(x,y) = xy^4 + 2x^3y^2 + \Phi'(x)$