

Bagaimana ide kalian untuk menemukan fungsi $M(x,y)$ sedemikian sehingga PD bernilai exact.

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

$$\frac{\partial F}{\partial x}(x,y)$$

$$\frac{\partial F}{\partial y}(x,y)$$

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

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

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

$$\therefore M(x,y) = 4x \left(\frac{1}{4} y^4 \right) + 4x^3 \left(\frac{1}{2} y^2 \right) + \phi(y)$$

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

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

$$F(x,y) = 2x^2 \left(\frac{1}{4} y^4 \right) + x^4 \left(\frac{1}{2} y^2 \right) + \phi(y)$$

$$\therefore \frac{\partial F}{\partial x}(x,y) = M(x,y) = 4x \left(\frac{1}{4} y^4 \right) + 4x^3 \left(\frac{1}{2} y^2 \right) + \phi'(y)$$