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1). Tentukan $\frac{dy}{dx}$ dari $2x^9y^2 - 6x^3 + 3y - 1 = 0$

Jika $\frac{dx}{dy} = y'$

$$\begin{aligned} \Rightarrow (18x^8y^2 + 2x^9yy') - 18x^2 + 3y' &= 0 \\ 2x^9yy' + 3y' - 18x^2 + 18x^8y^2 &= 0 \\ y'(2x^9y + 3) &= 18x^2 - 18x^8y^2 \\ y' &= \frac{18x^2 - 18x^8y^2}{2x^9y + 3} // \end{aligned}$$

2). Tentukan $\frac{dy}{dx}$ dari $\cos(xy) = 6x^9 + 7y$

Jika $\frac{dx}{dy} = y'$

$$\begin{aligned} \Rightarrow -\sin(xy) \cdot (y + xy') &= 54x^8 + 7y' \\ -y \sin(xy) - xy' \sin(xy) - 7y' &= 54x^8 \\ -y' (x \sin(xy) + 7) &= 54x^8 + y \sin(xy) \\ y' &= -\frac{54x^8 + y \sin(xy)}{x \sin(xy) + 7} \end{aligned}$$

3). Bila $F(x) = (6x^4 + x^2)^9 (2x+3)$
Tentukan $F'(x) = ?$

Misal $u = (6x^4 + x^2)^9 =$

$$= (6^9 x^{36} + x^{18}) \rightarrow u' = (78)^9 x^{12} + 11x^{10}$$

$$v = 2x + 3 \rightarrow v' = 2$$

$$F'(x) = u'v + v'u$$

$$\begin{aligned} &= ((78)^9 x^{12} + 11x^{10})(2x+3) + 2((6)^9 x^{36} + x^{18}) \\ &= ((156)^9 x^{13} + 22x^{11} + 234x^{12} + 33x^{10} + (12)^9 x^{13} + 2x^{14}) \\ &= ((168)^9 x^{13} + 234x^{12} + 24x^{11} + 33x^{10}) \\ &= (168x^4 + 234x^3 + 24x^2 + 33x)^9 // \end{aligned}$$

$$\begin{aligned} F''(x) &= 9(168x^4 + 234x^3 + 24x^2 + 33x)^8 (672x^3 + 702x^2 + 48x + 33) \\ &= 27(224x^3 + 234x^2 + 16x + 11)(168x^4 + 234x^3 + 24x^2 + 33x)^8 // \end{aligned}$$

4). Bila $F(x) = 4y - 3x + 7$
Tentukan $F''(x) = ?$

Jika $F''(x) = y''$

Misal $4y - 3x + 7 = 0$

$$4y' - 3 = 0$$

$$4y' = 3$$

$$y' = \frac{3}{4} //$$

$$y'' = 0 //$$