

Answer on Question #47270 – Math – Calculus

$(x - \frac{1}{x})(x^2 + \frac{1}{x^2})$ differentiate it w.r.t x by dis formula $u(\frac{du}{dx}) + v(\frac{dv}{dx})$

Solution:

$$y = \left(x - \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)$$

Derivative product rule:

$$(fg)' = f'g + fg'$$

In our case:

$$\begin{aligned} f &= \left(x - \frac{1}{x}\right); g = \left(x^2 + \frac{1}{x^2}\right) \\ y' = (fg)' &= \left(1 + \frac{1}{x^2}\right)\left(x^2 + \frac{1}{x^2}\right) + \left(x - \frac{1}{x}\right)\left(2x - \frac{2}{x^3}\right) = \\ &= \frac{3}{x^4} + 3x^2 - \frac{1}{x^2} - 1 \end{aligned}$$

Answer: $y' = \frac{3}{x^4} + 3x^2 - \frac{1}{x^2} - 1.$