

Differentiation - Product Rule

Differentiate each function with respect to x .

1) $y = -x^3(3x^4 - 2)$

2) $f(x) = x^2(-3x^2 - 2)$

3) $y = (-2x^4 - 3)(-2x^2 + 1)$

4) $f(x) = (2x^4 - 3)(x^2 + 1)$

5) $f(x) = (5x^5 + 5)(-2x^5 - 3)$

6) $f(x) = (-3 + x^{-3})(-4x^3 + 3)$

7) $y = (-2x^4 + 5x^2 + 4)(-3x^2 + 2)$

8) $y = (x^4 + 3)(-4x^5 + 5x^4 + 5)$

$$9) y = (5x^4 - 3x^2 - 1)(-5x^2 + 3)$$

$$10) f(x) = (-10x^2 - 7\sqrt[5]{x^2} + 9)(2x^3 + 4)$$

$$11) y = (5 + 3x^{-2})(4x^5 + 6x^3 + 10)$$

$$12) y = (-6x^4 + 2 + 6x^{-4})(6x^4 + 7)$$

$$13) f(x) = \left(-7x^4 + 10x^{\frac{2}{5}} + 8\right)(x^2 + 10)$$

Critical thinking question:

- 14) A classmate claims that $(f \cdot g)' = f' \cdot g'$ for any functions f and g . Show an example that proves your classmate wrong.