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**Nombre del trabajo: Ejercicios de Cálculo de las derivadas de una función**

PASIÓN POR EDUCAR

**Materia: Biomatemáticas**

**Grado: 2°**

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# Ejercicios de derivadas

$$1. f(x) = 5$$

$$f'(x) = \frac{d}{dx}(5)$$

$$\underline{f'(x) = 0} //$$

$$2. f(x) = -2x$$

$$f'(x) = \frac{d}{dx}(-2x)$$

$$\underline{f'(x) = -2} //$$

$$3. f(x) = -2x + 2 = \frac{d}{dx}(-2x + 2)$$

$$f'(x) = \frac{d}{dx}(-2x) + \frac{d}{dx}(2)$$

$$f'(x) = -2 + 0$$

$$\underline{f'(x) = -2} //$$

$$4. f(x) = -2x^2 - 5$$

$$f'(x) = \frac{d}{dx}(-2x^2 - 5)$$

$$f'(x) = \frac{d}{dx}(-2x^2) - \frac{d}{dx}(5)$$

$$f'(x) = -2 \times 2x - 0$$

$$\underline{f'(x) = -4x} //$$

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$$5. f(x) = 2x^4 + x^3 - x^2 + 4$$

$$\frac{d}{dx}(f+g) = \frac{d}{dx}(f) + \frac{d}{dx}(g)$$

$$f'(x) = \frac{d}{dx}(2x^4) + \frac{d}{dx}(x^3) - \frac{d}{dx}(x^2) + \frac{d}{dx}(4)$$

$$f' = 2 \times 4x^3 + \frac{d}{dx}(x^3) - \frac{d}{dx}(x^2) + \frac{d}{dx}(4)$$

$$f'(x) = 2 \times 4x^3 + 3x^2 - \frac{d}{dx}(x^2) + \frac{d}{dx}(4)$$

$$f'(x) = 2 \times 4x^3 + 3x^2 - 2x + \frac{d}{dx}(4)$$

$$f'(x) = 2 \times 4x^3 + 3x^2 - 2x + 0$$

$$f'(x) = 8x^3 + 3x^2 - 2x$$

$$f'(x) = 8x^3 + 3x^2 - 2x //$$

$$6. f(x) = \frac{x^3 + 2}{3}$$

$$\frac{d}{dx}(axf) = ax \frac{d}{dx}(f)$$

$$f'(x) = \frac{1}{3} \times \frac{d}{dx}(x^3 + 2)$$

$$f'(x) = \frac{1}{3} \times \left( \frac{d}{dx}(x^3) + \frac{d}{dx}(2) \right)$$

$$f'(x) = \frac{1}{3} \times (3x^2 + 0)$$

$$f'(x) = \frac{1}{3} \times 3x^2$$

$$f'(x) = x^2 //$$

$$7. f(x) = \frac{1}{3x^2} \quad \frac{d}{dx}\left(\frac{1}{f}\right) = \frac{d}{dx}(f) \cdot \frac{1}{f^2}$$

$$f'(x) = \frac{d}{dx}(3x^2)$$

$$f'(x) = \frac{-3x \cdot \frac{d}{dx}(x^2)}{(3x^2)^2}$$

$$f'(x) = \frac{-3x \cdot 2x}{(3x^2)^2}$$

$$f'(x) = \frac{-2}{3x^3}$$

$$8. f(x) = \frac{x+1}{x-1}$$

$$\frac{d}{dx}\left(\frac{x+1}{x-1}\right)$$

$$f'(x) = \frac{\frac{d}{dx}(x+1) \cdot (x-1) - (x+1) \cdot \frac{d}{dx}(x-1)}{(x-1)^2}$$

$$f'(x) = \frac{1(x-1) - (x+1) \cdot 1}{(x-1)^2}$$

$$f'(x) = \frac{1(x-1) - (x+1) \cdot 1}{(x-1)^2} = \frac{x-1-(x+1)}{(x-1)^2} = \frac{x-1-x-1}{(x-1)^2}$$

$$f'(x) = \frac{-2}{(x-1)^2}$$

$$9. f(x) = 5(x^2 - 3) \cdot (x^2 + x + 4)$$

$$f'(x) = \frac{d}{dx} ((5x^2 - 3) \cdot (x^2 + x + 4))$$

$$f'(x) = \frac{d}{dx} (5x^4 + 5x^3 + 20x^2 - 3x^2 - 3x - 12)$$

$$f'(x) = \frac{d}{dx} (5x^4 + 5x^3 + 17x^2 - 3x - 12)$$

$$f'(x) = \frac{d}{dx}(5x^4) + \frac{d}{dx}(5x^3) + \frac{d}{dx}(17x^2) + \frac{d}{dx}(-3x) + \frac{d}{dx}(-12)$$

$$f'(x) = 5 \cdot 4x^3 + 5 \cdot 3x^2 + 17 \cdot 2x - 3 - 0$$

$$\underline{\underline{f'(x) = 20x^3 + 15x^2 + 34x - 3}}$$