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**Biomatematicas**

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**Ejercicios de derivada**

**2° semestre**

$$1. f(x) = 5 \quad f'(x) = \underline{0}$$

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

$$3. f(x) = -2x + 2 = f'(x) = \underline{-2}$$

$$4. f(x) = -2x^2 + 5 = f'(x) = \underline{-4x}$$

$$5. f(x) = 2x^4 + x^3 - x^2 + 4 = f'(x) = \underline{8x^3 + 3x^2 - 2x}$$

6.  $f(x) = \frac{x^3 + 2}{3} = \frac{x^3}{3} + \frac{2}{3} = f'(x) = \frac{1}{3} \frac{d}{dx} x^3 + \frac{d}{dx} \frac{2}{3}$   
 $= \frac{1}{3} (3x^2) + 0 = \underline{\frac{1}{3} x^2}$

$$7. f(x) = \frac{1}{3x^2} = \frac{1}{3} x^{-2} = \frac{dx}{dy} = -\frac{2}{3} x^{-3} = -\frac{2}{3} x^{-3} = -\frac{2}{3} \cdot \frac{1}{x^3} = \underline{-\frac{2}{3x^3}}$$

$$8. f(x) = \frac{x+1}{x-1} = \frac{(x+1) \frac{d}{dx}(x-1) - (x-1) \frac{d}{dx}(x+1)}{(x-1)^2} = \frac{(x+1)(1+0) - (x-1)(1+0)}{(x-1)^2} = \frac{(x+1) - (x-1)}{(x-1)^2}$$

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

$$f'(x) = (10x)(x^2 + x + 4) + (5x^2 - 3)(2x + 0)$$

$$f'(x) = 10x^3 + 10x^2 + 40x + 10x^3 - 6x$$

$$f'(x) = \underline{20x^3 + 10x^2 + 34x}$$

Formulas

$$y = f(x) = [cx^n] \frac{dy}{dx} = f'(x) = c \cdot n \cdot x^{n-1}$$

$$y = f(x) = a(x) \pm b(x) \rightarrow \frac{dy}{dx} = f'(x) = a'(x) \pm b'(x)$$

$$a^{-n} = \frac{1}{a^n} \quad (a \pm b)' = a' \pm b'$$

$$y = f(x) = a(x) \cdot b(x) \rightarrow \frac{dy}{dx} = f'(x) = a'(x) \cdot b(x) + a(x) \cdot b'(x)$$

$$(a \cdot b)' = a' \cdot b + a \cdot b'$$

$$\left(\frac{u}{v}\right)' = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

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

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

