



**Mi Universidad**

## **Problematario**

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*Nombre del tema: Derivadas*

*Parcial: Unidad 3*

*Nombre de la Materia: Calculo*

*Nombre del profesor: Luis Enrique Meneses*

*Nombre de la Licenciatura: Bachillerato en recursos humanos*

*Cuatrimestre: Cuarto*

# Plataforma

$$11. f(x) = (3x - 2)(x^2 + x + 1)$$

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

$$v = f(x) = (x^2 + x + 1) = 2x + 1$$

$$du = \frac{d}{dx} (3x - 2) = 3$$

$$dv = \frac{d}{dx} (x^2 + x + 1) = 2x + 1$$

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

$$= 6x^2 - 4x + 3x - 2 + 3x^2 + 3x + 3$$

$$= 6x^2 + 3x^2 - 4x + 3x + 3x + 3 - 2$$

$$= 6x^2 + 3x^2 - 4x + 3x + 3x + 3 - 2$$

$$= 9x^2 + 2x + 1$$

$$12. g(x) = (2x + 4)(x^3 - x + 5)$$

$$du = \frac{d}{dx} (2x + 4) = 2$$

$$dv = \frac{d}{dx} (x^3 - x + 5) = 3x^2 - 1$$

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

$$= 6x^3 + 12x^2 - 2x - 4 + 2x^3 - 2x + 10$$

$$= 6x^3 + 2x^3 + 12x^2 - 2x + 10 - 4$$

$$= 8x^3 + 12x^2 - 2x + 6$$

$$13. \quad h(x) = (5x-1)(x^2+2x+3)$$

$$du = \frac{d}{dx}(5x-1) = 5$$

$$dv = \frac{d}{dx}(x^2+2x+3) = 2x+2$$

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

$$= 10x^2 - 2x + 10x - 2 + 5x^2 + 10x + 15$$

$$= 10x^2 + 5x^2 + 10x + 10x - 2x + 15 - 2$$

$$= 15x^2 + 18x + 13$$

$$14. \quad P(x) = (4x+6)(x^3-2x+1)$$

$$du = \frac{d}{dx}(4x+6) = 4$$

$$dv = \frac{d}{dx}(x^3-2x+1) = 3x^2-2$$

$$= (4x+6)(3x^2-2) + (x^3-2x+1)(4)$$

$$= 12x^3 + 18x^2 - 8x - 12 + 4x^3 - 8x + 4$$

$$= 12x^3 + 4x^3 + 18x^2 - 8x - 8x - 12 + 4$$

$$= 16x^3 + 18x^2 - 16x - 8$$

$$\begin{aligned}
 15. \quad g(x) &= (x-2)(3x^2+x-4) \\
 du &= \frac{d}{dx}(x-2) = 1 \\
 dv &= \frac{d}{dx}(3x^2+x-4) = 6x+1 \\
 &= (x-2)(6x+1) + (3x^2+x-4)(1) \\
 &= 6x^2 - 12x + 1x - 2 + 3x^2 + x - 4 \\
 &= 6x^2 + 3x^2 - 12x + 1x + x - 4 - 2 \\
 &= 9x^2 - 10x - 6
 \end{aligned}$$

$$\begin{aligned}
 16. \quad f(x) &= \frac{3x-2}{x^2+1} \\
 u &= 3x-2 & v &= x^2+1 \\
 du &= 3 & dv &= 2x \\
 &= \frac{(3x-2)(2x) - (x^2+1)(3)}{(x^2+1)^2} \\
 &= \frac{6x^2 - 4x - [3x^2 + 3]}{(x^2+1)^2} \\
 &= \frac{6x^2 + 4x - 3x^2 - 3}{(x^2+1)^2} \\
 &= \frac{3x^2 - 4x - 3}{(x^2+1)^2}
 \end{aligned}$$

$$\begin{aligned}
 17. \dots g(x) &= \frac{5x^3 - 4}{x + 2} \\
 u &= 5x^3 - 4 & v &= x + 2 \\
 du &= 15x^2 & dv &= 1 \\
 &= \frac{(5x^3 - 4)(1) - (x + 2)(15x^2)}{(x + 2)^2} \\
 &= \frac{5x^3 - 4 - [15x^3 + 30x^2]}{(x + 2)^2} \\
 &= \frac{5x^3 - 4 - 15x^3 - 30x^2}{(x + 2)^2} \\
 &= \frac{-10x^3 - 30x^2 - 4}{(x + 2)^2}
 \end{aligned}$$

$$18. - h(x) = \frac{2x^2 - 3}{x^2 + x - 1}$$

$$u = 2x^2 - 3$$

$$v = x^2 + x - 1$$

$$du = 4x$$

$$dv = 2x + 1$$

$$= \frac{(2x^2 - 3)(2x + 1) - (x^2 + x - 1)(4x)}{(x^2 + x - 1)^2}$$

$$= \frac{4x^3 - 6x + 2x^2 - 3 - [4x^3 + 4x^2 - 4x]}{(x^2 + x - 1)^2}$$

$$= \frac{4x^3 - 6x + 2x^2 - 3 - 4x^3 - 4x^2 + 4x}{(x^2 + x - 1)^2}$$

$$= \frac{-2x^2 - 2x - 3}{(x^2 + x - 1)^2}$$

19. -  $P(x) = \frac{x^4 + 1}{3x - 5}$

$$U = x^4 + 1 \qquad V = 3x - 5$$

$$dU = 4x^3 \qquad dV = 3$$

$$= \frac{(x^4 + 1)(3) - (3x - 5)(4x^3)}{(3x - 5)^2}$$

$$= \frac{3x^4 + 3 - [12x^4 - 20x^3]}{(3x - 5)^2}$$

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

$$= \frac{-9x^4 + 20x^3 + 3}{(3x - 5)^2}$$

$$20. \quad a(x) = \frac{6x^5 - 4x}{x^2 + 1}$$

$$u = 6x^5 + 4x \quad v = x^2 + 1$$

$$du = 30x^4 - 4 \quad dv = 2x$$

$$= \frac{(6x^5 - 4x)(2x) - (x^2 + 1)(30x^4 - 4)}{(x^2 + 1)^2}$$

$$= \frac{12x^6 - 8x^2 - [30x^6 + 30x^4 - 4x^2 - 4]}{(x^2 + 1)^2}$$

$$= \frac{12x^6 - 8x^2 - 30x^6 - 30x^4 + 4x^2 + 4}{(x^2 + 1)^2}$$

$$= \frac{18x^6 - 30x^4 - 4x^2 + 4}{(x^2 + 1)^2}$$