



José Manuel Martínez Valdez  
Cuarto cuatrimestre  
Técnico en Administración de Recursos  
Humanos

Actividad de plataforma 4

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Ing. Juan José Ojeda Trujillo

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# Plataforma

José Manuel Martínez Valdez

$$1. Y = 2X^3 - 6X^2 - 7X + 11$$

$$Y' = 6X^2 - 12X - 7$$

$$2. Y = \frac{11}{4X^3} + \frac{7}{3X^2} \quad \frac{vdu - udv}{v^2}$$

$$\frac{11}{4} X^{3-1} = \frac{33}{4} X^2 +$$

$$Y' = \frac{33}{4} X^2 + \frac{14}{33} X$$

$$\frac{7}{3} X^2 = \frac{14}{33} X$$

$$3. Y = 11 - 2X^2 - 6X^3$$

$$Y' = -4X - 18X^2$$

$$4. Y = \frac{X}{X^2 - 8X} \quad \frac{vdu - udv}{v^2}$$

$$v = X^2 - 8X$$

$$dv = 2X - 8$$

$$\frac{X^2 - 8X - 2X^2 - 8X}{(X^2 - 8X)^2}$$

$$5. Y = \frac{5}{3X-4} \quad \frac{dv \cdot u - du \cdot v}{v^2}$$

$$u = 5 \quad v = 3X - 4$$

$$du = 0 \quad dv = 3$$

$$Y' = \frac{3 \cdot 5 - 0 \cdot (3X-4)}{(3X-4)^2}$$

$$Y' = \frac{15}{(3X-4)^2}$$

$$6. \quad y = \frac{3x+2}{2x-1} \quad \frac{u}{v} = \frac{dv \cdot u - du \cdot v}{v^2} \quad \begin{array}{l} u = 3x+2 \\ du = 3 \end{array} \quad \begin{array}{l} v = 2x-1 \\ dv = 2 \end{array}$$

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

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

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

$$7. \quad y = \frac{3x^2+1}{2x} \quad \frac{vdu - udv}{v^2}$$

$$\begin{array}{l} u = 3x^2+1 \\ du = 6x \end{array} \quad \begin{array}{l} v = 2x \\ dv = 2 \end{array}$$

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

$$y' = \frac{12x^2 - 6x^2 - 2}{4x^2}$$

$$y' = \frac{6x^2 - 2}{4x^2} = \frac{6x^2}{4x^2} + \frac{-2}{4x^2}$$

$$y' = \frac{3}{2} + \frac{-2}{4x^2}$$

$$8. y = \frac{5}{4+x^2}$$

$$\frac{dv \cdot u - du \cdot v}{v^2}$$

$$u = 5 \\ du = 0$$

$$v = 4+x^2 \\ dv = 2x$$

$$y' = \frac{4+x^2(5) - 0(2x)}{(4+x^2)^2}$$

$$y' = \frac{20 + 5x^2}{(4+x^2)^2}$$

$$9. y = (1+2x)^2$$

$$n u^{n-1}$$

$$n = 2$$

$$u = 1+2x$$

$$n-1 = 1$$

$$du = 2$$

$$y' = 2 \cdot (1+2x) \cdot 2$$

$$y' = 2 + 4x \cdot 2$$

$$y' = 4 + 8x$$

$$10. y = \frac{3}{5x^2} - \frac{3}{4x} + \frac{1}{8}$$

$$\frac{3}{5} x^2 = \frac{6}{5} x$$

$$B = \frac{6}{5} x - \frac{3}{4}$$

$$\frac{3}{4} x = \frac{3}{4}$$

$$\frac{1}{8} \rightarrow 0$$

$$11. - \frac{2x^2}{\tan x^2}$$

$$U = 2x^2 \\ du = 4x$$

$$V = \tan x^2 \\ dv = 2x \sec^2 x^2$$

$$y' = \frac{4x \cdot \tan x^2 - 4x^3 \sec x^2}{(\tan x^2)^2}$$

$$12. - \overset{U}{3x^2} \overset{V}{\cos 3x^2}$$

$$U \cdot V = \frac{du \cdot V - dv \cdot U}{V^2}$$

$$U = 3x^2 \quad du = 6x$$

$$V = \cos 3x^2 \quad dv = -\sin 6x$$

$$y' = \frac{6x \cdot \cos 3x^2 - -\sin 6x \cdot 3x^2}{(\cos 3x^2)^2}$$

$$13. - \sin x^2 \cos x^2$$

$$U \cdot V = \frac{du \cdot V + dv \cdot U}{V^2}$$

$$U = \sin x^2$$

$$V = \cos x^2$$

$$du = 2x \cos x^2$$

$$dv = -2x \sin x^2$$

$$y' = -2x (\sin x^2)^2 + 2x (\cos x^2)^2$$

$$14. - \cot \overbrace{3x^3}^u = \csc^2 u \cdot \frac{du}{dx}$$

$$- \csc^2 3x^3 (9x^2)$$

$$-9x^2 \csc^2 3x^3$$

$$15. - \sqrt{2x^3 \cos x^2} \quad n u^{n-1} \frac{du}{dx} \quad 2x^3 \cdot \cos x^2$$

$$(2x^3 \cos x^2)^{1/2}$$

$$u = 2x^3 \quad v = \cos x^2$$

$$du = 6x^2 \quad dv = -2x \sin x^2$$

$$\frac{1}{2} \cdot (2x^3 \cos x^2)^{-1/2} \cdot ( \quad )$$

$$\rightarrow -4x^4 \sin x^2 + 6x^2 \cos x^2$$

$$y' = \frac{-4x^4 \sin x^2 + 6x^2 \cos x^2}{2\sqrt{2x^3 \cos x^2}}$$

$$y' = \frac{-4x^4 \sin x^2 + 6x^2 \cos x^2}{\sqrt{2x^3 \cos x^2}}$$

Ex 16

$$16. \sqrt{2x^3 \sec 2x} \quad u^n = nu^{n-1} \cdot \frac{du}{dx}$$

$$y' = (2x^3 \sec x^2)^{1/2}$$

$$y' = \frac{1}{2} (2x^3 \sec x^2)^{-1/2}$$

$$\begin{matrix} u & v \\ 2x^3 & \sec x^2 \end{matrix}$$

$$(2x^3)' (2x \sec x^2 \tan x^2)$$

$$+ (6x^2) (\sec x^2)$$

$$\textcircled{6x^2 \sec x^2}$$

$$y' = \left[ \frac{1}{2} (2x^3 \sec x^2)^{-1/2} \right] \cdot \left[ -1x^4 \sec x^2 \tan x^2 + 6x^2 \sec x^2 \right]$$

$$y' = \frac{4x^4 \sec x^2 \tan x^2 + 6x^2 \sec x^2}{2 \sqrt{2x^3 \sec x^2}}$$

$$17. \underbrace{2x^3}_u \cdot \underbrace{\sqrt{5x^3}}_v \quad u \cdot v = du \cdot v + dv \cdot u \quad \begin{matrix} u = 2x^3 \\ du = 6x^2 \end{matrix}$$

$$y' = 6x^2 \cdot (5x^3)^{1/2} + (15x^2)^{1/2} \cdot 2x^3$$

$$\begin{matrix} v = (5x^3)^{1/2} \\ dv = (15x^2)^{1/2} \end{matrix}$$

$$y' = 6x^2 \cdot \sqrt{5x^3} + \sqrt{15x^2} \cdot 2x^3$$

$$18. \quad 4 \sec 2x^4 = \sec u \cdot \tan u \frac{du}{dx}$$

$$du = 8x^3$$

$$(4 \sec 2x^4) (\tan 2x^4) (8x^3)$$

$$4 \cdot (8x^3 \sec 2x^4) (\tan 2x^4)$$

$$(32x^3 \sec 2x^4) (\tan 2x^4)$$

$$19. \quad (\cos 2x^3)^3 \quad u^n = nu^{n-1} \frac{du}{dx}$$

$$u = \cos 2x^3$$

$$du = -\sin 2x^3 \cdot (6x^2)$$

$$n-1 = 2$$

$$du = -6x^2 \sin 2x^3$$

$$n = 3$$

$$y' = 3 (\cos 2x^3)^2 \cdot (-6x^2 \sin 2x^3)$$

$$y' = -18x^2 \sin 2x^3 \cdot (\cos 2x^3)^2$$

$$20. \quad y = \frac{1}{(\sin x^2)^2} \quad u^n = nu^{n-1} \frac{du}{dx}$$

$$y = (\sin x^2)^{-2}$$

$$n = -2 \quad n-1 = -3$$

$$u = \sin x^2 \quad du = 2x \cos x^2$$

$$y' = -2 (\sin x^2)^{-3} \cdot (2x \cos x^2)$$

$$y' = (\sin x^2)^{-3} \cdot (-4x \cos x^2)$$

$$y' = \frac{-4x \cos x^2}{(\sin x^2)^3}$$