



Mi Universidad

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Parcial: 4

Nombre de la Materia: Cálculo

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Nombre de la Licenciatura: RH

Cuatrimestre: Cuarto

$$1. y = (2x^3 - 6x^2) - (7x + 11)$$

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

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

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

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

$$y' = \frac{d}{dx} (7x + 11)$$

$$y' = \frac{d}{dx} (7x) + \frac{d}{dx} (11)$$

$$\underline{\underline{y' = 7}}$$

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$$2. 11/4x^3 + 7/3x^2$$

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

$$\frac{7}{3} x^{2-1} = \frac{14}{3} x$$

$$y' = \frac{33}{4} x^2 + \frac{14}{3} x$$

$$3. y = 11 - 2x^2 - 6x^3 = -4x - 18x^2$$

$$4. y = \frac{x}{(x^2 - 8x)}$$

$$\frac{vdu - u dv}{v^2}$$

$$u = x$$

$$du = 1$$

$$v = x^2 - 8x$$

$$dv = 2x - 8$$

$$y' = x^2 - 8x(1) - x(2x - 8)$$

$$x^2 - 8x - 2x^2 - 8x$$

$$5. \quad y = \frac{5}{(3x-4)}$$

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

$$v = 3x - 4$$
$$dv = 3x$$

$$vdu - udv$$

$$\cancel{3x-4} (0) - 5 (3x)$$

$$y' = \frac{15}{(3x-4)^2}$$

$$6. y = \frac{(3x+2)u}{(2x-1)v} \quad \frac{vdu - u dv}{v^2}$$

$$u = 3x+2 \quad v = 2x-1$$

$$du = 3x \quad dv = 2x$$

$$y' = 2x-1(3x) - 3x+2(2x)$$

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

$$7. y = \frac{(3x^2+1)u}{(2x)v} \quad \frac{vdu - u dv}{v^2}$$

$$u = 3x^2+1 \quad v = 2x$$

$$du = 6x \quad dv = 2x$$

$$y' = 2x(6x) - 3x^2(2x)$$

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

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

$$= 3 - \frac{3}{2}x^2$$

$$8. y = \frac{5u}{(4+x^2)v} \quad \frac{vdu - u dv}{v^2}$$

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

$$du = 0 \quad dv = 2x$$

$$y' = 4+x^2(0) - 5(2x)$$

$$y' = \frac{10x}{(4+x^2)^2}$$

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

$$y' = \frac{d}{dx} (1+2x)$$

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

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

$$y' = 4(1+2x)$$

$$10. y = \frac{3}{5}x^2 - \frac{3}{4}x + \frac{1}{8} \rightarrow 0$$

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

$$11. \frac{2x^2}{\tan x^2} \quad \frac{u}{v} = \frac{vdu - u dv}{v^2}$$

$$u = 2x^2 \quad v = \tan x^2$$

$$du = 4x \quad dv = 2x \sec^2 x^2$$

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

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

$$12. 3x^2 \cos 3x^2$$

$$u dv + v du$$

$$u = 3x^2$$

$$du = 6x$$

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

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

$$-18x^3 \sin 3x^2 + 6x \cos 3x^2$$

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

$$13. \text{SEN } x^2 \text{ COS } x^2 \quad u \text{ du} + v \text{ dv}$$

$$u = \text{SEN } x^2 \quad v = \text{COS } x^2$$

$$du = 2x \text{ COS } x^2 \quad dv = -2x \text{ SEN } x^2$$

$$\text{SEN } x^2 (2 \text{ COS } x^2) + \text{COS } x^2 (2x \text{ COS } x^2)$$

$$y' = \frac{2x(\text{SEN } x^2 \text{ COS } x^2 + (\text{COS } x^2)^2)}{(\text{SEN } x^2)^2 + (\text{COS } x^2)^2}$$

$$4. \text{COT } 3x^3 \quad \frac{d}{dx} (\text{COT } u) = -\text{CSC}^2 u \cdot \frac{du}{dx}$$

$$u = 3x^3$$

$$du = 9x^2$$

$$y' = -9x^2 \text{ CSC}^2 3x^3$$

$$15. \sqrt{2x^3 \text{ COS } x^2}$$

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

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

$$du = 2x^3$$

$$dv = \text{COS } x^2$$

$$(2x^3) (\text{COS } x^2 \text{ SEN } x^2)$$

$$(6x^2) (\text{COS } x^2)$$

$$4x^4 \text{ COS } x^2 \text{ SEN } x^2 + 6x^2 \text{ COS } x^2$$

$$y' = \frac{1}{2} (2x^3 \text{ COS } x^2)^{-1/2} \cdot (4x^4 \text{ COS } x^2 \text{ SEN } x^2 + 6x^2 \text{ COS } x^2)$$

$$y' = \frac{4x^4 \text{ COS } x^2 \text{ SEN } x^2 + 6x^2 \text{ COS } x^2}{2 \sqrt{2x^3 \text{ COS } x^2}}$$

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

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

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

$$\frac{1}{2} = \frac{2}{2} \times \frac{1}{2}$$

$$du = 2x^3$$

$$dv = \sec x^2$$

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

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

$$4x^4 \sec x^2 \tan x^2 + 6x^2 \sec x^2$$

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

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

$$17. 2x^3 \sqrt{5x^3}$$

$$u = 2x^3$$

$$du = 6x^2$$

$$v = \sqrt{5x^3} = (5x^3)^{1/2} \rightarrow n u^{n-1} \frac{du}{dx}$$

$$\frac{dv}{dx} = \frac{1}{2} (5x^3)^{-1/2} \cdot 15x^2$$

$$\frac{dv}{dx} = \frac{15x^2}{2} \cdot (5x^3)^{-1/2} = \frac{15x^2}{2 \sqrt{5x^3}}$$

$$y' = \frac{30x^5}{2 \sqrt{5x^3}} + \sqrt{5x^3} \cdot 6x^2$$

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

$$18. -4 \sec 2x^4$$

$$u = 2x^4$$

$$du = 8x^3$$

$$\frac{d}{dx} (\sec u) = \sec u \cdot \tan u \cdot \frac{du}{dx}$$

$$y' = -4 (\sec 2x^4) \cdot \tan 2x^4 \cdot (8x^3)$$

$$-32x^3 \sec 2x^4 \cdot \tan 2x^4$$

$$19. y = (\cos 2x^3)^3$$

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

$$du = -\text{SEN} 2x^3 \cdot (6x^2)$$

$$dv = -6x^2 \text{SEN} 2x^3$$

$$n-1 = 3-1$$

$$n-1 = 2$$

$$\begin{aligned} n=3 \quad y' &= 3(\cos 2x^3)^2 \cdot (-6x^2 \text{SEN} 2x^3) \\ \hline y' &= -18x^2 \text{SEN} 2x^3 \cdot (\cos 2x^3)^2 \end{aligned}$$

$$u^n = n u^{n-1} \frac{du}{dx}$$

20. $\neq \pm$

$$\frac{1}{(\text{SEN } x^2)^2}$$

comblo do signo

$$\text{Fórmula } U^n = nU^{n-1} \frac{du}{dx}$$

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

$$n = -2$$

$$n-1 = -3$$

$$u = \text{SEN } x^2$$

$$du = 2x \text{ COS } x^2$$

$$y' = -2(\text{SEN } x^2)^{-3} \cdot (2x \text{ COS } x^2)$$

$$y' = (\text{SEN } x^2)^{-3} \cdot (4x \text{ COS } x^2)$$

$$y' = \frac{-4x \text{ COS } x^2}{(\text{SEN } x^2)^3}$$