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Materia: Calculo

Parcial: III

$$10. \quad y = 2x^3 - 6x^2 - 7x + 11$$

$$2(3x)^3 - 6(2x)^2 - 7(1) \quad \emptyset$$

$$\underline{6x^2 - 12x - 7}$$

$$3. \quad y = 11 - 2x^2 - 6x^3$$

$$\emptyset \cdot 2(2x)^2 - 6(3x)^3$$

$$\underline{4x - 18x^2}$$

$$2. \quad y = \frac{11}{4x^3} + \frac{7}{3x^2}$$

$$y = \frac{11 \cdot x^3}{4} + \frac{7 \cdot x^2}{3}$$

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

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

$$\frac{vdu - udv}{v^2}$$

$$u = x \quad v = x^2 - 8x$$

$$du = 1 \quad dv = 2x - 8$$

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

$$y = \frac{x^2 - 8x - 2x^2 + 8x^2}{v^2}$$

$$5. \quad \frac{5u}{(3x-4)v}$$

$$\frac{vdu - udv}{v^2}$$

$$u = 5$$

$$du = \emptyset$$

$$v = 3x - 4$$

$$dv = 3$$

$$3x - 4 \cdot \emptyset - 5(3)$$

$$\frac{3x - 15}{3x - 4^2}$$

$$6. \quad y = \frac{3x+2}{2x-1} \quad \frac{vdu - udv}{v^2}$$

$$u = 3x+2$$

$$du = 3x$$

$$v = 2x-1$$

$$dv = 2x$$

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

$$\frac{6x - 3x - 6x + 4}{2x-1} = \frac{7}{2x-1}$$

$$7. \quad y = \frac{3x^2+10}{2x} \quad \frac{vdu - udv}{v^2}$$

$$u = 3x^2$$

$$du = 6x$$

$$v = 2x$$

$$dv = 2$$

$$\frac{(2x) \cdot (6x) - 3x^2(2)}{2x^2}$$

$$\frac{12x^2 - 6x^2}{2x^2}$$

$$8. \quad \frac{5}{4+x^2} \quad \frac{vdu - udv}{v^2}$$

$$u = 5$$

$$du = 0$$

$$v = 4+x^2$$

$$dv = 2x$$

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

$$\frac{-10x}{(4+x^2)^2}$$

$$9. \quad y = (1+2x)^2 \quad \text{no } dv$$

$$n = 2$$

$$n-1 = 1$$

$$v = 1+2x$$

$$dv = 2$$

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

$$y' = \frac{4(1+2x)}{1+2x}$$

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

$$\frac{d}{dx} \left(\frac{3}{5x^2} - \frac{3}{4}x + \frac{1}{8} \right)$$

$$= \frac{6}{5}x^{-3} - \frac{3}{4} + 0$$

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

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

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

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

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

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

$$12. \frac{3x^2}{\cos 3x^2}$$

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

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

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

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

$$13. \frac{\sin x^2}{\cos x^2}$$

$$u = \sin x^2$$

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

$$v = \cos x^2$$

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

$$\sin x^2 (-2x \sin x^2) + \cos x^2 (2x \cos x^2)$$

$$-2x(\sin x^2)^2 + 2x(\cos x^2)^2$$

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

$$14. - \cot 3x^2 \quad u = 3x^2 \quad \frac{du}{dx} = 6x$$

$$du = 6x^2 \cdot 3$$

$$y' = 9x^2 \sec^2(3x^2)$$

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

$$u = 2x^3$$

$$du = 6x^2$$

$$v = \cos x^2$$

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

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

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

$$(2x^3) (\cos x^2 \sin x^2)$$

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

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

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

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

$$2\sqrt{2x^3} (\cos x^2)$$

$$16. \sqrt{2x^3} \sec 2x$$

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

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

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

$$2x^3 \sec x^2$$

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

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

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

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

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

$$\sqrt{2x^3} \sec 2x$$

$$v du + u dv$$

$$v = \sqrt{5x^3} = (5x^3)^{1/2}$$

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

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

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

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

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

$$u = 2x^3$$

$$du = 6x^2$$

$$18. -4 \sec 2x^4 \quad \frac{d}{dx}(\sec u) = \sec u \cdot \tan u \cdot \frac{d}{dx}$$

$$u = 2x^4$$

$$du = 8x^3$$

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

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

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

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

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

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

$$n = 3$$

$$n-1 = 2$$

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

$$y' = \underline{-18x^2 \sin 2x^3 \cdot \cos^2 2x^3}$$

$$20. y = \frac{1}{(\sin x^2)^2}$$

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

$$n = -2$$

$$n-1 = -3$$

$$u = \sin x^2$$

$$du = 2x \sin x^2$$

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

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

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