



Mi Universidad

Problemario

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Nombre del tema: Derivaciones

Parcial IV

Nombre de la materia: Cálculo

Nombre del profesor: Juan José Ojeda Trujillo

Nombre de la Licenciatura: Técnico En enfermería general

Semestre IV

$$1 \quad y = 2x - 6x - 7x + 11$$

$$\frac{d}{dx} (2x^3) - \frac{d}{dx} (6x^2) - \frac{d}{dx} (7x) + \frac{d}{dx} (11)$$

$$2 \frac{d}{dx} (x^3) - 6 \frac{d}{dx} (x^2) - 7 \frac{d}{dx} (x)$$

$$6x^2 - 12x - 7$$

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

$$\frac{11}{4} \frac{d}{dx} (x^3) + \frac{7}{3} \frac{d}{dx} (x^2)$$

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

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

$$\frac{d}{dx} (11) - \frac{d}{dx} (2x^2) - \frac{d}{dx} (6x^3)$$

$$2(x^2) - 6(x^3)$$

$$4x - 18x^2$$

$$4 = y = x / (x^2 - 8x)$$

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

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

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

$$dx (2x - 8) = 2x^2 - 8x$$

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

$$\frac{2x^2 - 8x + x^2 - 8x}{(x^2 - 8x)^2} = \frac{3x^2 - 16x}{(x^2 - 8x)^2}$$

$$5 \quad y = 5 / (3x - 4)$$

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

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

$$\frac{-5}{(3x - 4)^2} = 5 (3x - 4)^{-2} - 10 (3x - 4)^{-3} \cdot (3)$$

$$-30 (3x - 4)^{-3} = \frac{-30}{(3x - 4)^3}$$

$$6 \quad y = (3x + 2) / (2x - 1)$$

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

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

$$du = 3$$

$$dv = 2$$

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

$$7 \quad y = (3x^2 + 1) / (2x)$$

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

$$du = 6x$$

$$dv = 2$$

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

$$\frac{3x^2 + 1}{2x}$$

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

$$8 \quad y = 5 / (4 + x^2)$$

$$-\frac{5}{(4 + x^2)^2} \left(\frac{2x}{1} \right) = \frac{-10x}{(4 + x^2)^2}$$

$$9 \quad y = (1 + 2x)^2$$

$$1 + 2x \quad y' = 2 \cdot (1 + 2x) \cdot 2 = 4(1 + 2x) = 8x + 4$$

$$10 \quad y = (3/5)x^2 - (3/4)x + 1/8$$

$$y' = (3/5) \cdot 2x - (3/4) = 1.2x - 3/4$$

$$11 \quad y = 2x^2 / \tan(x^2)$$

$$u = 2x^2 \quad du = 4x$$

$$y = \tan(x^2) \quad dy = \sec^2(x^2) \cdot 2x$$

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

$$12 \quad y = -3x^2 \cdot \cos(3x^2)$$

$$u = -3x^2 \quad du = -6x$$

$$v = \cos(3x^2) \quad dv = -\sin(3x^2) \cdot 6x$$

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

$$y' = -6x^3 \cos + 9x^4 \sin(6x)$$

$$13 \quad y = \sin(x^2) \cdot \cos(x^2)$$

$$u = \sin(x^2) \quad v = \cos(x^2)$$

$$du = \cos(x^2) \cdot 2x \quad dv = -\sin(x^2) \cdot 2x$$

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

$$14 \quad y = \cos(3x^2)$$

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

$$15 \quad y = \sqrt{2x^3} \cdot \cos(x^2)$$

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

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

$$16 \quad y = \sqrt{2x^3} \cdot \sec(2x)$$

$$y' = \frac{1}{2} \sqrt{2} \sqrt{x^3} \tan(2x) \sec(2x) + (3\sqrt{2} \sqrt{x^3})$$

$$\sec(2x) / 2x$$

$$17 \quad y = 2x^3 \cdot \sqrt{5x^3}$$

$$y' = 9\sqrt{5} x^2 \sqrt{x^3}$$

$$18 \quad y = 4 \cdot \sec(2x^4)$$

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

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

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

$$20 \quad y = 1 / \sec(x^2))^2$$

$$y' = -4x \cos(x^2) / \sec(x^2))^3$$

