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Examen "Calculo"

1. $Y = 2x3 / (3x+9) = \frac{2x3}{(3x+9)}$

$y = \frac{d}{dx}\left(\frac{2x^3}{2x+9}\right) \cdot y' = \frac{d}{dx}\left(\frac{2x3}{3(x+3)}\right) = \left(\frac{2x}{x+3}\right)$

$y_1 = \frac{d}{dx}(2x)(x+3) - 2x \frac{d}{dx}(x+3)$

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

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

2. $Y = 4x^3 / \cos 2x^2$

$\frac{d}{dx}\frac{U}{V} = \frac{VU' - UV'}{V^2}$ $\quad U = 4x^3 \quad V = \cos 2x^2$ $\quad U' = 12x^2 \quad V' = +4x \cdot \operatorname{sen} 2x^2$

$f(x)\cos x^2 = f(x) = 2x \cdot \operatorname{sen} x^2$

$= \frac{(\cos 2x^2)(12x^2) - (4x^3)(-4x \cdot \operatorname{sen} 2x^2)}{(\cos 2x^2)}$

$= \frac{12x^2 + 16x^4 \cdot \operatorname{sen} 2x^2}{(\cos^{-1} 2x^2)^2}$

$= \frac{12x^2}{\cos(2x^2)} + \frac{16x^4 \operatorname{sin}(2x^2)}{\cos(2x^2)}$

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

$= (\operatorname{sen} 2x^2)(4x \operatorname{sen} 2x^2) + (\cos 2x^2)(4x \cos 2x^2)$

$= -8x \operatorname{sen}^2(2x^2) + 4x \cos^2 2x^2$

$= 4x \cos^2 [2x^2 - 4x \operatorname{sen}^2 (2x^2)$

5: $Y = \operatorname{sen}(a-bx)$ $\frac{d}{du}(\sin(u)) \frac{d}{dx}(a-bx)$

$Y' = \cos(u) \, d/dx (a-bx) = \cos(a-bx) \frac{d}{dx} a-bx$

$Y' = \cos(a-bx)(d/dx(a) + d/dx(-bx))$

$Y' = \cos(a-bx)(0 + d/dx(-bx)) = \cos(a-bx)(d/dx(bx))$

$Y' = \cos(a-bx)(-b \, d/dx(x)) = \cos(a-bx)(-b(1))$

$Y' = \cos(a-bx)(-b) = \boxed{Y' = -b \cos(a-bx)}$

6. $Y = \sec \frac{2x2}{(x2+4)} = \frac{\sec(4)}{2x+4} = \frac{d}{dx}\left(\frac{A}{f}\right) = \frac{-9 \, d/dx \, f}{f^2}$

$Y' = \frac{-\sec(4) \; d/dx(2x) + d/dx(4)}{2x+4^2} = \sec(4) \frac{2}{(-2x+4)}$

$\boxed{Y' = \frac{-2 \sec(4)}{(2x+4)^2}}$

7.- $Y = (1+2x)2 = 2+4x$

$Y' = d/dx\ (2) + 4\ d/dx\ (x)$

$Y' = 4\ (1) = \underline{Y' = 4}$

8.- $Y = \dfrac{2-x}{x-2}$

$Y' = -\dfrac{(x-2)}{x-2} = -1 = Y' = d/dx\ (-1)$

$\underline{Y' = 0}$