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- 1 - Gráfico 1: Gráfico 2:
- a) -2,1,3 a) -1,1,2
- b) -1 b) 0
- c) 0,2

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

a) $-2x$

3 - a) $3x^2$ c) $\sqrt{2} \cdot x^{\sqrt{2}-2}$ e) $-\frac{4}{3} \cdot x^{-\frac{7}{3}}$

b) $\frac{2}{3} \cdot x^{-\frac{1}{3}}$ d) $-\frac{4}{x^5}$

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

$y' = \frac{e + e^{x+1} \cdot x - e^{x+1}}{x^2}$

b) $e^{2x} = \frac{d}{dy}(e^y) \cdot \frac{d}{dx}(2x) = e^y \cdot 2 = e^{2x} \cdot 2 = \boxed{2e^{2x}}$

5 - $\frac{d}{dx} (x^0 + 1)(x^3 + 3) = x^5 + 3x^2 + x^3 + 3$

$5x^4 + 3 \cdot 2x + 3x^2 + 0$

$\boxed{5x^4 + 3x^2 + 6x}$

6- $y = \frac{t^2-1}{t^3-1} \cdot \left(\frac{f(x)}{g(x)} \right)' = \frac{2t \cdot (t^3+1) - (t^2-1) \cdot 3t^2}{(t^3+1)^2} =$

a)

$$\frac{2t^4 + 2t - (3t^4 - 3t^2)}{(t+1) \cdot (t^2+t+1)^2} = \frac{-t^4 + 2t + 3t^2}{((t+1) \cdot (t^2+t+1))^2} =$$

$$\frac{-t(t^3-2-3t)}{(t+1)^2 \cdot (t^2-t+1)^2} = \boxed{\frac{-t^2+2t}{(t^2-t+1)^2}}$$

b) $y' = e^{-x} = e^x \cdot -x = e^x \cdot (-1) = e^{-x} \cdot (-1) = \boxed{-\frac{1}{e^x}}$

7- $u(1) = 2$; $u'(1) = 0$; $v(1) = 5$; $v' = -1$

a) $\frac{d}{dx} (u \cdot v) = 0 \cdot 5 + 2 \cdot (-1) = \boxed{-2}$

b) $\frac{d}{dx} \left(\frac{u}{v} \right) = \frac{0 \cdot 5 - 2 \cdot (-1)}{5^2} = \boxed{\frac{2}{25}}$

c) $\frac{d}{dx} \left(\frac{v}{u} \right) = \frac{-1 \cdot 2 - 5 \cdot 0}{2^2} = \frac{-2}{4} = \boxed{-\frac{1}{2}}$

d) $\frac{d}{dx} (7v - 2u) = 7 \cdot 5 - 2 \cdot 0 = \boxed{35}$

8-

$$a) y' = \frac{2 \cdot (3x-2) - 3 \cdot (2x+5)}{(3x-2)^2}$$

$$b) y' = \frac{-3 \cdot (3x^2+x) - (4-3x) \cdot (5x+1)}{(3x^2+x)^2}$$

$$c) \frac{2x(x+0,5) - 1 \cdot x^2 - 4}{(x+0,5)^2}$$

$$d) \frac{x^2+2x+x+2}{x^2-2x+x+2} = \frac{x^2+3x+2}{x^2-3x+2} = \frac{(2x+3) \cdot (x^2-3x+2) - (x^2+3x+2) \cdot (2x-3)}{(x^2-3x+2)^2}$$

$$e) \frac{d}{dx} (2e^{-x}) + \frac{d}{dx} (e^{3x}) = 2e^{-x} \cdot -1 + e^{3x} \cdot 3$$

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

$$g) y' = 3x^2 \cdot e^x + e^x \cdot (x^3)$$