Curso: Ensino Superior Bacharelado em Ciência da Computação Disciplina: Cálculo Diferencial e Integral I

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## Lista - Atividade Derivadas da Função Composta e Regra da Cadeia

Nome:		

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01- Calcule a derivada das funções compostas através da regra da cadeia.

a) 
$$y = (x^2 + 1)^7$$

b) 
$$f(x) = \sqrt{x^2 + 1}$$

c) 
$$v = \sqrt{5x + 2}$$

d) 
$$y = \sqrt[3]{\sqrt{2x^2 - x}}$$

e) 
$$y = (2x + 1)^3$$

f) 
$$y = \sqrt{7x + 3}$$

g) 
$$y = \left(\frac{x}{1-3x}\right)^5$$

$$h)f(x) = (2x - 7)^3$$

*i*) 
$$f(x) = (25 + x^2)^{-\frac{1}{2}}$$

j) 
$$g(x) = 3(9x - 4)^4$$

02- Calcule as derivadas das funções Exponenciais:

a) 
$$y = 12^x$$

b) 
$$f(x) = \left(\frac{2}{5}\right)^x$$

c) 
$$f(x) = -4e^x$$

d) 
$$y = (7.10^x)$$

e) 
$$y = e^{(3x^2} - 4)$$

f) 
$$f(x) = 2^{(5x-3x^2)}$$

g) 
$$y = \frac{1^{\sqrt{6x}}}{3}$$

h) 
$$y = e^{\frac{x+1}{x-1}}$$

i) 
$$y = 6e^{\sqrt{x}}$$

j) 
$$y = 3^{2x^2 + 3x - 1}$$

03- Calcule as derivadas das funções Logarítmicas:

A) 
$$y = log_2 3x$$

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

C) 
$$y = log_6 x$$

D) 
$$y = log_4 5x$$

E) 
$$y = \ln(x^3 - 4)$$

F) 
$$y = \sqrt{\ln x}$$

G) 
$$y = ln12$$

H) 
$$y = log_5(2x^3)$$

$$y = \log_3(x^2 + 3x + 4)$$

J) 
$$y = log_{10}(x^3 + 1)$$

K) 
$$f(x) = log_3(x^2 - 5)$$

## **Gabarito**

## 01-

a)
$$\frac{dy}{dx}$$
 =  $14x(x^2+1)^6$ 

$$b)\frac{dy}{dx} = \frac{x}{\sqrt{x^2 + 1}}$$

$$c)\frac{dy}{dx} = \frac{5}{2\sqrt{5x+2}}$$

d) 
$$\frac{dy}{dx} = \frac{4x-1}{6(2x^2-x)^{\frac{7}{5}}}$$

e)
$$\frac{dy}{dx} = 6(2x+1)^2$$

f) 
$$\frac{dy}{dx} = \frac{7}{2\sqrt{7x+3}}$$

$$g)\frac{dy}{dx} = \frac{5x^4}{(1-3x)^6}$$

h)
$$\frac{dy}{dx} = 6(2x - 7)^2$$

i) 
$$\frac{dy}{dx} = -\frac{x}{(25+x^2)^{\frac{3}{2}}}$$

$$j)\frac{dy}{dx} = 108(9x - 4)^3$$

## **02**-

$$y' = 12^x \cdot \ln(12)$$

$$y' = (\frac{2}{5})^x . \ln \frac{2}{5}$$

$$y' = -4e^x$$

$$y' = 7 \ln(10) \cdot 10^x$$

$$y' = 6x \cdot e^{(3x^2 - 4)}$$

$$y' = 2^{(5x-3x^2)} . ln(2) . (5-6x)$$

$$y' = \frac{1^{\sqrt{6x}}}{3} \cdot \ln \frac{1}{3} \cdot \frac{1}{2\sqrt{6x}}$$

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

$$y' = \frac{3e^{\sqrt{x}}}{\sqrt{x}}$$

03-

d)
$$y' = \frac{1}{x \cdot \ln(4)}$$
 h) $y' = \frac{3}{x \cdot \ln(5)}$ 

$$h)y' = \frac{3}{x \cdot \ln(5)}$$

$$a)y' = \frac{1}{x \cdot \ln(2)}$$

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

a)
$$y' = \frac{1}{x \cdot \ln(2)}$$
 e)  $y' = \frac{3x^2}{x^3 - 4}$  i) $y' = \frac{(2x + 3)}{(x^2 + 3x + 4) \cdot \ln(3)}$ 

b) 
$$y' = \frac{2x}{x^2} + 1$$

f) 
$$y' = \frac{1}{2x\sqrt{\ln(x)}}$$

b) 
$$y' = \frac{2x}{x^2} + 1$$
 f)  $y' = \frac{1}{2x\sqrt{\ln(x)}}$  j)  $y' = \frac{3x^2}{(x^3 + 1).\ln(10)}$ 

c) 
$$y' = \frac{1}{x \cdot \ln(6)}$$

$$g)y' = \frac{1}{12}$$

c) 
$$y' = \frac{1}{x \cdot \ln(6)}$$
 g)  $y' = \frac{1}{12}$  k)  $y' = \frac{2x}{(x^2 - 5) \cdot \ln(3)}$