

CÁLCULO II - LISTA 03

DERIVADA DE FUNÇÕES EXPONENCIAIS E REGRA DA CADEIA

Exercício 1 (PLT - Pág. 109) Encontre as derivadas das funções.

1) $f(x) = (x + 1)^{99}$

13) $k(x) = (x^3 + e^x)^2$

3) $w = (t^2 + 11)^{100}$

15) $v(t) = t^2 e^{-ct}$

5) $w = (\sqrt{t} + 1)^{100}$

27) $f(z) = \frac{\sqrt{z}}{e^x}$

9) $g(x) = e^{\pi x}$

39) $f(w) = (5w^2 + 3)e^{w^2}$

11) $y = \pi^{(x+2)}$

42) $f(x) = e^{-(x-1)^2}$

DERIVADA DE FUNÇÕES LOGARÍTMICAS E TRIGONOMÉTRICAS

Exercício 2 Calcule as derivadas:

1) $f(x) = \ln(4 + 5x)$

12) $g(x) = \frac{\operatorname{sen} x}{1 - \cos x}$

2) $f(t) = \ln(3t + 1)^2$

13) $h(t) = \frac{\operatorname{tg} t}{\cos t - 4}$

3) $g(t) = \ln^2(3t + 1)$

14) $f(y) = \frac{1 + \operatorname{sen} y}{1 - \operatorname{sen} y}$

4) $f(x) = 3\operatorname{sen} x$

15) $f(x) = (x - \operatorname{sen} x)(x + \cos x)$

5) $g(x) = \operatorname{tg} x + \operatorname{cotg} x$

16) $G(t) = \frac{2 \cdot \operatorname{cosec} t - 1}{\operatorname{cosec} t + 2}$

6) $f(t) = 2t \cdot \cos t$

17) $g(t) = \operatorname{sen}^2(3t^2 - 1)$

7) $g(x) = x \cdot \operatorname{sen} x + \cos x$

18) $f(x) = (\operatorname{tg}^2 x - x^2)^3$

8) $h(x) = 4\operatorname{sen} x \cdot \cos x$

19) $f(x) = e^{\cos x}$

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

20) $f(x) = e^x \operatorname{sen}(e^x)$

10) $f(x) = 3 \sec x \cdot \operatorname{tg} x$

21) $f(y) = \ln(\operatorname{sen} 5y)$

11) $h(z) = \frac{2 \cos z}{z + 1}$

22) $f(x) = \ln \sqrt{\operatorname{tg} x}$

RESPOSTAS - Exercício 1 .

1) $99(x+1)^{98}$

13) $2(x^3 + e^x)(3x^2 + e^x)$

3) $200t(t^2 + 11)^{99}$

15) $te^{-ct}(2 - ct)$

5) $\frac{50(\sqrt{t}+1)^{99}}{\sqrt{t}}$

27) $\frac{1-2z}{2e^z\sqrt{z}}$

9) $\pi e^{\pi x}$

39) $2we^{w^2}(8 + 5w^2)$

11) $\pi^{x+2} \ln \pi$

42) $-2(x-1)e^{-(x-1)^2}$

RESPOSTAS - Exercício 2 .

1) $f'(x) = \frac{5}{4+5x}$

12) $g'(x) = \frac{1}{\cos x - 1}$

2) $f'(t) = \frac{6}{3t+1}$

13) $h'(t) = \frac{\sec^2 t(\cos t - 4) + \operatorname{sen} t \cdot \operatorname{tg} t}{(\cos t - 4)^2}$

3) $g'(t) = 6 \frac{\ln(3t+1)}{3t+1}$

14) $f'(y) = \frac{\cos^2 y}{(1 - \operatorname{sen} y)^2}$

4) $f'(x) = 3 \cos x$

15) $2x + \cos x - x \cos x - \cos^2 x - \operatorname{sen} x - x \operatorname{sen} x + \operatorname{sen}^2 x$

5) $g'(x) = \sec^2 x - \operatorname{cosec}^2 x$

16) $G'(t) = \frac{\operatorname{cosec} t \cdot \operatorname{cot} g t \cdot (-2\operatorname{cosec} t + 2\operatorname{cosec} t - 5)}{(\operatorname{cosec} t + 2)^2}$

6) $f'(t) = 2(\cos t - t \cdot \operatorname{sen} t)$

17) $g'(t) = 12t \cdot \operatorname{sen}(3t^2 - 1) \cdot \cos(3t^2 - 1)$

7) $g'(x) = x \cdot \cos x$

18) $f'(x) = 3(\operatorname{tg}^2 x - x^2)^2 \cdot (2\operatorname{tg} x \cdot \sec^2 x - 2x)$

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

19) $f'(x) = -\operatorname{sen} x \cdot e^{\cos x}$

9) $f'(x) = 2x(1 + \cos x)$

20) $f'(x) = e^x \operatorname{sen}(e^x) + e^{2x} \cdot \cos e^x$

10) $f'(x) = 3 \sec x (\operatorname{tg}^2 x + \sec^2 x)$

21) $f'(y) = 5 \operatorname{cot} g(5y)$

11) $h'(z) = \frac{-2(z \operatorname{sen} z + \operatorname{sen} z + \cos z)}{(z+1)^2}$

22) $f'(x) = \frac{\sec^2 x}{\sqrt{\operatorname{tg} x}}$