

PRECEPTORIA - LISTA 8

Cálculo Diferencial e Integral I

Data da lista:	30/07, 01/08 e 02/08
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Cursos:	Eng. Mecânica, Eng.Elétrica e Eng. Alimentos
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1. Nos itens a seguir, ache a derivada da função dada.

- (a) $f(x) = \text{sen}(4x)$
- (b) $f(t) = \sqrt[3]{1 + \text{tg}(t)}$
- (c) $f(x) = \frac{(x^2+3)^3}{(5x-8)^2}$
- (d) $f(z) = \frac{(z^2-5)^3}{(z^2+4)^2}$
- (e) $f(x) = \text{sen}^2(3t^2 - 1)$
- (f) $g(x) = \text{tg}^2(x^2)$
- (g) $f(x) = e^{\sqrt{x}}$
- (h) $f(x) = (2\text{sen}(x) - 3\text{cos}(x))^3$
- (i) $f(y) = \frac{3\text{sen}(2y)}{\text{cos}^2(2y)+1}$
- (j) $f(x) = \text{sen}(e^x)$
- (k) $f(x) = x\text{sen}\left(\frac{1}{x}\right)$
- (l) $f(x) = 4\text{cos}(\text{sen}(x))$
- (m) $f(x) = \text{sen}^2(\text{cos}(2x))$
- (n) $f(x) = e^{-5x}\text{cos}(3x)$
- (o) $f(x) = e^{x\text{cos}(x)}$
- (p) $f(x) = \text{sen}(\text{sen}(\text{sen}(x)))$

2. Nos itens a seguir, ache a derivada da função dada.

- (a) $f(x) = 4x^{\frac{1}{2}} + 5x^{-\frac{1}{2}}$
- (b) $f(x) = \sqrt{1 + 4x^2}$
- (c) $f(x) = (5 - 3x)^{\frac{2}{3}}$
- (d) $f(x) = 2\text{cos}(\sqrt{t})$

- (e) $f(x) = \sqrt{3\text{sen}(x)}$
- (f) $f(x) = \text{tg}(x^2 + 1)$
- (g) $f(x) = \frac{\sqrt{t-1}}{\sqrt{t+1}}$
- (h) $g(t) = \sqrt{2t} + \sqrt{\frac{2}{t}}$
- (i) $g(x) = \sqrt[3]{(3x^2 + 5x - 1)^2}$

3. Calcule as seguintes derivadas.

- (a) $\frac{d}{dx}\left(\frac{\sqrt{x^2-1}}{x}\right)$
- (b) $\frac{d}{dz}(\text{sen}(\sqrt[3]{z})\cos(\sqrt[3]{z}))$
- (c) $\frac{d}{dx}\left(\sqrt{\frac{\cos(x)-1}{\text{sen}(x)}}\right)$
- (d) $D_x(\sqrt{9 + \sqrt{9 - x}})$
- (e) $D_z\left(\frac{1}{\sqrt{1+\cos^2(2z)}}\right)$
- (f) $D_x(\sqrt{x}\text{tg}(\sqrt{\frac{1}{x}}))$
- (g) $\frac{d}{dt}\left(\sqrt{\frac{\text{sen}(t)+1}{1-\text{sen}(t)}}\right)$

4. Nos itens a seguir, ache $\frac{dy}{dx}$ por derivação implícita.

- (a) $x^2 + y^2 = 16$
- (b) $x^3 + y^3 = 8xy$
- (c) $x^2 + y^2 = 7xy$
- (d) $\frac{1}{x} + \frac{1}{y} = 1$
- (e) $\sqrt{x} + \sqrt{y} = 4$
- (f) $2x^3y + 3xy^3 = 5$
- (g) $(2x + 3)^4 = 3y^4$
- (h) $\sqrt{xy} + 2x = \sqrt{y}$
- (i) $x^2y^3 = x^4 - y^4$
- (j) $y = \cos(x - y)$
- (k) $x = \text{sen}(x + y)$
- (l) $x\text{sen}(y) + y\cos(x) = 1$
- (m) $\cos(x + y) = y\text{sen}(x)$
- (n) $\text{sen}(x) + \cos(y) = \text{sen}(x)\cos(y)$