

MAT144 – Cálculo Diferencial e Integral I para Oceanografia
Respostas da Lista de Exercícios 6

1. (a) $f'(x) = 18x - 8$; (b) $f'(x) = 1$; (c) $f'(x) = \sin x + x \cos x$; (d) $f'(x) = 18x^2 - 6x + 4$; (e) $f'(x) = \frac{2}{(x+1)^2}$; (f) $f'(x) = \frac{2x^2 + 2x + 2}{(1-x^2)^2}$; (g) $f'(x) = -\csc^2 x$.
2. (a) $1000x(x^2-2)^{499}$; (b) $3(3x-1)^{-2}$; (c) $2x(x-1)(2x-1)^{-5}$; (d) $\frac{-2(2x-1)^2(x^2-2x-9)}{(x^2+3)^3}$;
(e) $-\sin 2x$; (f) $-2x \sin(x^2)$; (g) $\frac{\cos(\ln x)}{x}$; (h) $\cot x$; (i) $5^{\sqrt{x}} \ln 5 \frac{1}{2\sqrt{x}}$; (j) $e^{\sqrt{x}} \frac{1}{2\sqrt{x}} + \frac{1}{2}\sqrt{e^x}$; (k) $\ln(\sin(\ln x)) + \cot(\ln x)$.
3. (a) x^3 ; (b) $\frac{4}{3}x^3 + x^2 - 5x$; (c) $-\cos x$.
4. $y = 7x - 10$
5. $(3, 2)$ e $(-3, -2)$.
6. $\frac{1}{1+x^2}$
7. (a) $\frac{dy}{dx} = -\sqrt{\frac{y}{x}}$; (b) $\frac{dy}{dx} = \frac{-3x^2 - 2xy}{x^2 + 8y}$; (c) $\frac{dy}{dx} = 1 + \frac{e^x(1+x)}{\sin(x-y)}$.
8. $y = -2$
9. $12m/s^2$.
10. (a) $y'' = 20x^3 + 12$; (b) $y'' = -4 \cos 2x$; (c) $y'' = 2 \cos x - x \sin x$; (d) $y'' = (x^2 + 1)^{-3/2}$.