UNIVERSIDADE VEIGA DE ALMEIDA
LISTA I DE MATEMÁTICA II - Prof. Edézio

1. Calcular a função derivada das seguintes funções:

(a) $f(x) = 5$
(b) $g(x) = -17$
(c) $h(x) = \frac{2}{5}$
(d) $f(x) = x$
(e) $g(x) = 2x$
(f) $h(x) = -3x$
(g) $f(x) = x^2$
(h) $f(x) = x^3$
(i) $g(x) = x^4$
(j) $f(x) = x^{1/2}$
(k) $g(x) = x^{3/2}$
(l) $h(x) = x^{-2}$
(m) $f(x) = x^{-3}$
(n) $g(x) = x^{-4}$
(o) $g(x) = \frac{1}{x}$
(p) $h(x) = \frac{1}{x^2}$
(q) $f(x) = \frac{2}{x^3}$
(r) $f(x) = \sqrt[3]{x}$
(s) $g(x) = \sqrt[3]{x^2}$
(t) $h(x) = x^{-2/3}$
(u) $g(x) = 2x^3$
(v) $h(x) = \frac{2}{5}x^3$
(w) $f(x) = \frac{x^5}{3}$
(x) $g(x) = \frac{x^5}{5}$

(y) $h(x) = \dfrac{-2x^5}{5}$

(z) $f(x) = \ln x$ e $g(x) = e^x$

2. Utilize as regras de derivação para calcular a função derivada de:

(a) $f(x) = x^3 + 3x^2 + x + 1$

(b) $g(x) = 2x^4 - 5x^2 + \dfrac{2}{x^3}$

(c) $h(x) = x^2 \ln x$

(d) $f(x) = \dfrac{x^2 - 3}{x + 1}$

(e) $g(x) = e^x \ln x$

(f) $h(x) = 3x^{-5} - 2x^{-3} + x^2 - \ln x$

Respostas:

1. (a),(b),(c): 0; (d) 1; (e) 2; (f) -3; (g) 2x; (h) $3x^2$; (i) $4x^3$; (j) $\dfrac{1}{2}x^{-1/2}$;

(k) $\dfrac{3}{2}x^{1/2}$; (l) $-2x^{-3}$; (m) $-3x^{-4}$; (n) $-4x^{-5}$; (o) $-\dfrac{1}{x^2}$; (p) $\dfrac{-2}{x^3}$;

(q) $\dfrac{-6}{x^4}$; (r) $\dfrac{1}{3\sqrt[3]{x^2}}$; (s) $\dfrac{2}{3\sqrt[3]{x}}$; (t) $\dfrac{-2}{3}x^{-5/3}$; (u) $6x^2$; (v) $\dfrac{6}{5}x^2$; (w) $\dfrac{5x^4}{3}$;

(x) x^4; (y)$-2x^4$; (z) $f'(x) = \dfrac{1}{x}$ e $g'(x) = e^x$.

2. (a) $f'(x) = 3x^2+6x+1$; (b) $g'(x) = 8x^3-10x-\dfrac{6}{x^4}$; (c) $h'(x) = 2x \ln x+x$;

(d) $f'(x) = \dfrac{x^2 + 2x + 3}{(x + 1)^2}$; (e) $g'(x) = e^x \ln x + \dfrac{e^x}{x}$;

(f) $h'(x) = -15x^{-6} + 6x^{-4} + 2x - \dfrac{1}{x}$