FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA
Departamento de Matemática

Derivadas

1. Calcule a derivada das seguintes funções:

(a) $\log(x+\sqrt{1+x^2})$;

(b) $\dfrac{x^2}{\sqrt{9-x^2}}$;

(c) $\log\left(\dfrac{1}{1+x}\right)$;

(d) $\dfrac{e^{3\,x}}{e^x-2}$;

(e) $\dfrac{1}{\sqrt{4\,x-x^2}}$;

(f) $\operatorname{sen}(3x)\cos(2x)$;

(g) $\log^2(x)$;

(h) $\dfrac{\operatorname{tg}(x)}{3+\operatorname{sen}^2(x)}$;

(i) $\dfrac{\operatorname{sen}^2(x)}{1+\cos^2(x)}$;

(j) $\dfrac{2\,x\,\log(x)}{(1+x^2)^2}$;

(k) $\cos\left(\log\left(\dfrac{1}{x}\right)\right)$;

(l) $(x\operatorname{sen}(x))^2$;

(m) $\dfrac{x^3}{(1+x^2)^2}$;

(n) $\operatorname{sen}(\sqrt{x+1})$;

(o) $\dfrac{1}{\sqrt[4]{x}+\sqrt{x}}$;

(p) $\dfrac{\operatorname{sen}(x)}{\cos(x)(\cos(x)-1)}$;

(q) $x^3\,\cos(x^2)$;

(r) $\dfrac{\log(\log(x))}{x}$;

(s) $\dfrac{e^{2x}+1}{e^x\,(2+e^{2x})}$;

(t) $\log(1-x^2)$;

(u) $e^{(e^x+x)}$;

(v) $\dfrac{x}{\cos^2(x)}$;

(w) $\dfrac{\cos(x)}{1+\cos(x)}$.

2. Calcule a derivada das seguintes funções:

(a) $x\,\log(x^2-1)$;

(b) $\dfrac{e^x+2}{e^{2\,x}+e^x}$;

(c) $\dfrac{x}{(x^2+1)\,\log(\sqrt{x^2+1})}$;

(d) $\dfrac{x-1}{(x^2+1)(x-2)^2}$;

(e) $\dfrac{e^x}{(e^{2x}+2)\,(e^x-1)}$;

(f) $\dfrac{7e^x+8}{(e^{2x}+4)(e^x-1)}$;

(g) $\log\left(\dfrac{x}{(x+3)^2}\right)$;

(h) $\dfrac{5}{2}(\cos(x))^{2/5}$;

(i) $x\,\operatorname{sen}(x^2)$;

(j) $\dfrac{x}{(x-3)(2+x^2)}$;

(k) $\dfrac{x^2}{\sqrt{4-x^2}}$;

(l) $\cos\left(\left(x+\dfrac{\pi}{2}\right)^2\right)$;

(m) $\dfrac{1}{(x-2)^2(1+x^2)}$;

(n) $\log\left(\dfrac{x}{x+3}\right)$;

(o) $\dfrac{1}{x^4-1}$;

(p) $\dfrac{1}{3+2\,\cos(x)}$;

(q) $x^2\,e^x$;

(r) $\dfrac{1}{2-\operatorname{sen}^2(x)}$;

(s) $(\log(x)+3)^2$.