Derivadas - Soluções

1. (a) $\dfrac{1}{\sqrt{1+x^2}}$

(b) $\dfrac{x(18-x^2)}{(9-x^2)\sqrt{9-x^2}}$

(c) $-\dfrac{1}{1+x}$

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

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

(f) $3\cos(3x)\cos(2x)-2\mathrm{sen}(3x)\mathrm{sen}(2x)$

(g) $\dfrac{2\log(x)}{x}$

(h) $\dfrac{3+\mathrm{sen}^2(x)(1-2\cos^2(x))}{\cos^2(x)(3+\mathrm{sen}^2(x))^2}$

(i) $\dfrac{2\,\mathrm{sen}(2x)}{(1+\cos^2(x))^2}$

(j) $\dfrac{2\left(\log(x)-3\,x^2\,\log(x)+x^2+1\right)}{(1+x^2)^3}$

(k) $\dfrac{1}{x}\cdot\mathrm{sen}\left(\log\left(\dfrac{1}{x}\right)\right)$

(l) $2\,x\,\mathrm{sen}(x)(\mathrm{sen}(x)+x\cos(x))$

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

(n) $\dfrac{1}{2\sqrt{x+1}}\cdot\cos\left(\sqrt{x+1}\right)$

(o) $-\dfrac{1+2\sqrt[4]{x}}{4\sqrt[4]{x^3}(\sqrt[4]{x}+\sqrt{x})^2}$

(p) $\dfrac{-\cos^3(x)+2\cos(x)-1}{\cos^2(x)(\cos(x)-1)^2}$

(q) $3\,x^2\,\cos(x^2)-2\,x^4\mathrm{sen}(x^2)$

(r) $\dfrac{1}{x^2\,\log(x)}-\dfrac{\log(\log(x))}{x^2}$

(s) $-\dfrac{e^{4x}+e^{2x}+2}{e^x\,(2+e^{2x})^2}$

(t) $\dfrac{2x}{x^2-1}$

(u) $(e^x+1)e^{(e^x+x)}$

(v) $\dfrac{\cos(x)+2x\,\mathrm{sen}(x)}{\cos^3(x)}$

(w) $\dfrac{-\mathrm{sen}(x)}{(1+\cos(x))^2}$

2. (a) $\log(x^2-1)+\dfrac{2x^2}{x^2-1}$

(b) $-\dfrac{e^{2x}+4e^x+2}{e^x(e^x+1)^2}$

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

(d) $-\dfrac{x\left(3x^2-6x+5\right)}{(x^2+1)^2(x-2)^3}$

(e) $\dfrac{e^x(-2e^{3x}+e^{2x}-2)}{(e^{2x}+2)^2\,(e^x-1)^2}$

(f) $\dfrac{-14e^{4x}-17e^{3x}+16e^{2x}-60e^x}{(e^{2x}+4)^2\,(e^x-1)^2}$

(g) $\dfrac{3-x}{x\,(x+3)}$

(h) $-\dfrac{\mathrm{sen}(x)}{(\cos(x))^{3/5}}$

(i) $\mathrm{sen}(x^2)+2x^2\cos(x^2)$

(j) $\dfrac{-2x^3+3x^2-6}{(x-3)^2(2+x^2)^2}$

(k) $\dfrac{x\,(8-x^2)}{(4-x^2)\sqrt{4-x^2}}$

(l) $-2\left(x+\dfrac{\pi}{2}\right)\mathrm{sen}\left(\left(x+\dfrac{\pi}{2}\right)^2\right)$

(m) $-\dfrac{4x^2-4x+2}{(x-2)^3(1+x^2)^2}$

(n) $\dfrac{3}{x\,(x+3)}$

(o) $-\dfrac{4x^3}{(x^4-1)^2}$

(p) $\dfrac{2\,\mathrm{sen}(x)}{(3+2\,\cos(x))^2}$

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

(r) $\dfrac{\mathrm{sen}(2x)}{(2-\mathrm{sen}^2(x))^2}$

(s) $\dfrac{2}{x}\cdot(\log(x)+3)$