$y = (\sqrt[3]{x})^x$ em $x = 1$

$\ln|y| = \ln|(\sqrt[3]{x})^x| = x \ln|x^{1/3}| = \frac{x}{3}\ln|x| - \frac{x}{3}\ln|x|$

$\frac{y'}{y} = \frac{1}{3}\ln|x| + \frac{x}{3}\cdot\frac{1}{x} = \frac{1}{3}(\ln|x|+1)$

$y' = \frac{1}{3}(\ln|x|+1)\cdot(\sqrt[3]{x})^x$

$y = x^{\sqrt{x}}$ em $x = 4$

$\ln|y| = \ln|x^{\sqrt{x}}| = \sqrt{x}\ln|x|$

$\frac{y'}{y} = \frac{1}{2\sqrt{x}}\cdot\ln|x| + \sqrt{x}\,\frac{1}{x} = \frac{1}{\sqrt{x}}\left(\frac{\ln|x|}{2}+1\right)$

$y' = \frac{1}{\sqrt{x}}\left(\frac{\ln|x|}{2}+1\right)x^{\sqrt{x}}$ em $x = 4$

$y = x^{\cos x}$

$\ln|y| = \ln|x^{\cos x}| = \cos x \ln|x|$

$\frac{y'}{y} = -\operatorname{sen}(x)\ln|x| + \cos(x)\frac{1}{x}$

$y' = \left(-\operatorname{sen}(x)\ln|x| + \frac{\cos(x)}{x}\right)x^{\cos x}$

$y = 3^x$ $y' = 3^x \ln(3)$

$y'' = \ln(3)\,3^x\cdot\ln(3) = 3^x(\ln(3))^2$

$y = 5\ln(x^5)$ $y' = 5\cdot\frac{5x^4}{x^5} = \frac{25}{x} = 25x^{-1}$

$y'' = 25(-1)\cdot x^{-2} = \frac{-25}{x^2}$

$y = \ln(2x+4)$ $y' = \frac{2}{2x+4} = \frac{1}{x+2} = (x+2)^{-1}$

$y'' = -1(x+2)^{-2}\cdot 1 = \frac{-1}{(x+2)^2}$

$$y = \log\left(\frac{1}{1+x}\right) = \log_{10}\left((1+x)^{-1}\right)$$

$$\frac{d}{dx}\log_a(x) = \frac{1}{\ln(a)\cdot x}$$

$$y' = \frac{1}{\ln(10)(1+x)^{-1}} \cdot (-1)(1+x)^{-2} = \frac{-1}{\ln(10)(1+x)}$$

$$h(x) = \frac{\operatorname{cossec}(3x)}{x^3} = \operatorname{cossec}(3x)\cdot x^{-3}$$

$$h'(x) = -\operatorname{cotg}(3x)\operatorname{cossec}(3x)\cdot 3\cdot x^{-3} + \operatorname{cossec}(3x)\cdot(-3)\cdot x^{-4}$$

$$= -3\operatorname{cossec}(3x)\left(\operatorname{cotg}(3x)\,x^{-3} + x^{-4}\right)$$

$$= -3\frac{\operatorname{cossec}(3x)}{x^3}\left(\operatorname{cotg}(3x) + \frac{1}{x}\right)$$

ou

$$= -\frac{3\operatorname{cossec}(3x)}{x^4}\left(x\operatorname{cotg}(x) + 1\right)$$