Anna Brillowska, EPM I

$$\left(x^{21}\cos^7(x^3)\right)' = (x^{21})' \cdot \cos^7(x^3) + x^{21} \cdot (\cos^7(x^3))' = 21x^{20} \cdot \cos^7(x^3) + x^{21} \cdot (7\cos^6 \cdot x^3) \cdot 3x^2$$

We calculate the derivative of x to the power of twenty one times cosine to power seven of x cubic. We should use the product rule. In our equation we have twenty one x to power twenty times cosine to power seven of x cubic plus x to the power of twenty one times seven cosines to power six of x cubic and times the derivative of the inner function, so three x square.

$$\left(\log_4(\log_3(\log_2 x))\right)' = \frac{1}{\log 3(\log 2x)\ln 4} \cdot \frac{1}{\log 2x \ln 3} \cdot \frac{1}{x \ln 2}$$

The derivative of logarithm with base four of the logarithm with base three of the logarithm with base two of x. In this example we should use „the chain rule". The most outer derivative is one over logarithm with base three of the logarithm with base two of x times the natural logarithm of four. Next we have to multiply the derivative of the inner function, so we have one over the logarithm with base two x times the natural logarithm of three. Finally the derivative of the most inner function is one over x times the natural logarithm of two.

$$\left(\frac{\sin x}{\arcsin x}\right)' = \frac{\cos x \cdot \arcsin x - \sin x \cdot \frac{1}{\sqrt{1-x^2}}}{(\arcsin x)^2}$$

We have to calculate a derivative of sine x over arcsine x. In this example we must use the quotient rule. Using this rule we have the derivative of sine x which is equal to cosine x, times arcsin x minus sine x times one over square root of one minus x square. Finally we must divide it by arcsine to power two, of x.

$$\left(5^{\operatorname{arctg}(4x)}\right)' = 5^{\operatorname{arctg}(4x)} \cdot \ln 5 \cdot \frac{1}{1+(4x)^2} \cdot 4$$

We have to calculate a derivative of five to power arc tangent of four x. We have five to the same power times the natural logarithm of 5 times the derivative of the inner function: one over one plus four x, in brackets, to power two times four.