So we are given an expression:

$$\sin\left(x \cdot \log_{10} x\right)$$

Let's diffirintiate it!

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(1 \cdot \log_{10} x + \frac{\frac{\left(x^{(-1)} \cdot 1 \cdot \ln 10 - \ln x \cdot 0 \cdot 10^{(-1)}\right)}{\ln 10}}{\ln 10} \cdot x\right) \cdot (-1)$$

Uhhh, let's simplify it a bit... SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\frac{\left(x^{(-1)} \cdot 1 \cdot \ln 10 - \ln x \cdot 0 \cdot 10^{(-1)}\right)}{\ln 10}}{\ln 10} \cdot x\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\frac{\left(x^{(-1)} \cdot \ln 10 - \ln x \cdot 0 \cdot 10^{(-1)}\right)}{\ln 10}}{\ln 10} \cdot x\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\frac{\left(x^{(-1)} \cdot \ln 10 - 0 \cdot 10^{(-1)}\right)}{\ln 10}}{\ln 10} \cdot x\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\frac{\left(x^{(-1)} \cdot \ln 10 - 0 \cdot 0.1\right)}{\ln 10}}{\ln 10} \cdot x\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\frac{\left(x^{(-1)} \cdot \ln 10 - 0\right)}{\ln 10}}{\ln 10} \cdot x\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\frac{x^{(-1)} \cdot \ln 10}{\ln 10}}{\ln 10} \cdot x\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{x^{(-1)} \cdot \ln 10}{\ln 10 \cdot \ln 10} \cdot x\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{x^{(-1)} \cdot \ln 10}{5.3019} \cdot x\right) \cdot (-1)$$

STRUCTURE

$$\cos\left(x^{1} \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{x^{(1+(-1))} \cdot \ln 10}{5.3019} \cdot 1\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{x^{(1+(-1))} \cdot \ln 10}{5.3019} \cdot 1\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{x^{0} \cdot \ln 10}{5.3019} \cdot 1\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{1 \cdot \ln 10}{5.3019} \cdot 1\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\ln 10}{5.3019} \cdot 1\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\ln 10}{5.3019}\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\ln 10}{5.3019}\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\ln 10}{5.3019}\right) \cdot (-1)$$

SIMPLE

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\ln 10}{5.3019}\right) \cdot (-1)$$

So finaly:

$$\cos\left(x \cdot \log_{10} x\right) \cdot \left(\log_{10} x + \frac{\ln 10}{5.3019}\right) \cdot (-1)$$