

$$2. \frac{2x}{x^2+10}$$

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

$$3. \frac{\cos(\ln(x))}{x}$$

$$f'(x) = \cos(\ln(x)) \cdot \frac{1}{x}$$

$$23. y' = 2x\ln(2x) + x ; y'' = 2\ln(2x) + 3$$

$$\begin{aligned}y' &= 2x \cdot \ln(2x) + x^2 \cdot (\frac{1}{2x} \cdot 2) = 2x\ln(2x) + x \\y'' &= 2 \cdot \ln(2x) + 2x \cdot (\frac{1}{2x} \cdot 2) + 1 = 2\ln(2x) + 3\end{aligned}$$

$$41. x^x(\ln(x) + 1)$$

$$\begin{aligned}y &= x^x = e^{\ln(x^x)} = e^{x\ln(x)} \\y' &= e^{x\ln(x)} \cdot (1 \cdot \ln(x) + x \cdot \frac{1}{x}) = x^x(\ln(x) + 1)\end{aligned}$$