

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

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

$$y'' = 2 \cdot \ln(2x) + 2x \cdot \left(\frac{1}{2x} \cdot 2\right) + 1 = 2 \ln(2x) + 3$$

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

$$y = x^x = e^{\ln(x^x)} = e^{x \ln(x)}$$

$$y' = e^{x \ln(x)} \cdot \left(1 \cdot \ln(x) + x \cdot \frac{1}{x}\right) = x^x(\ln(x) + 1)$$