Derivatives of exponential and logarithmic functions

3.11.1

Find $\frac{dy}{dx}$ (do not simplify your answer):

(a)

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

(b)

$$y = \sin\left(\sin\left(\sin 4^x\right)\right)$$

(c)

$$y = \log_5 \frac{\cot x}{2x-1}$$

3.11.2

For every positive integer n find $\frac{d^n y}{dx^n}$ if $y = xe^x$.