"So don’t be ashamed to wear your crown; you’re a king, you’re a queen inside and out"

**Problem 1.** Circle True or False. (1pt each)

a. ⟨True or False⟩ If \( f, g \) are differentiable everywhere, then \( f \circ g \) is also differentiable everywhere.

b. ⟨True or False⟩ If \( f \circ g \) is differentiable everywhere, then \( f, g \) also are differentiable everywhere.

**Problem 2.** Find the following derivatives \( f'(x) \): (3 pts each)

a. \( f(x) = (x^2 + 1) \cos(e^x) \)
b. $f(x) = \ln(x)^{\ln(x)}$

**Problem 3.** Find the derivative of $\ln(x^2 + 1) = x + y^2$ in terms of $x, y$. (3pts)