Problem 1. Find the following derivatives:

1) \( x \sin(x) \)

2) \( \frac{\tan(x)}{x} \)

3) \( \frac{x^2 + 1}{\ln(x)} \)

4) \( \frac{x e^x}{x^2 + 1} \)

Problem 2. 1) Find the tangent line to \( y = e^x \) at \((x, y) = (0, 1)\).

2) Find the line tangent to \( y = \ln(x) \) that has slope 2.

3) Find all values \( k \) such that \( y = k \sqrt{x} \) is tangent to the line \( y = x + 1 \).

4) Find all lines that are tangent to \( y = x^4 \) and that also pass through \((0, -3)\).