1. Use the Intermediate Value Theorem (IVT) to show that \( f(x) = e^x \ln(x + 1) \cos(\pi x) \) has a root between 2 and 3.

2. What (if anything) does the Extreme Value Theorem (EVT) tell us about \( f(x) = e^x \ln(x + 1) \cos(\pi x) \) on the interval \((2, 3)\)? Explain your answer.

3. What (if anything) does the Mean Value Theorem (MVT) tell us about \( f(x) = e^x \ln(x + 1) \cos(\pi x) \) on the interval \([2, 3]\)? Explain your answer.