“Do not be conformed to the patterns of this world, but be transformed by the renewal of your mind.”

Problem 1. Circle True or False.

a. (True or False) If \( P(x) \) is a Lagrange polynomial interpolating \( f(x) = 1/x \) at \( x_0 = 1, x_1 = 2, x_2 = 4 \), then \( P(4) = 1/4 \).

b. (True or False) If \( P(x) \) is a Lagrange polynomial interpolating \( f(x) = 1/x \) at \( x_0 = 1, x_1 = 2, x_2 = 4 \), then \( P'(4) = -1/16 \).

Problem 2. a. Find the Lagrange polynomial \( P(x) \) for \( f(x) = \ln(x) \) that interpolates at \( x_0 = 1, x_1 = 2, x_2 = 3 \).
b. Calculate an error bound for $|P(1.5) - \ln(1.5)|$.

c. Find the (clamped) cubic spline for $f(x) = 1/x$ between $x_0 = 1$ and $x_1 = 2$. 