#15/120 construct the Lagrange interpolating polynomial of degree 2 for

$$f(x) = \sin(\ln x)$$

on the interval $[2, 2.6]$ with points

$$x_0 = 2.0 \quad x_1 = 2.4 \quad x_2 = 2.6$$

Find a bound for the absolute error on [2, 2.6]

$$L_{2,0}(x) = \frac{(x-2.4)(x-2.6)}{(2-2.4)(2-2.6)}$$

$$L_{2,1}(x) = \frac{(x-2)(x-2.6)}{(2.4-2)(2.4-2.6)}$$

$$L_{2,2}(x) = \frac{(x-2.0)(x-2.4)}{(2.6-2.0)(2.6-2.4)}$$

$$P(x) = \sin(\ln 2) L_{2,0}(x) + \sin(\ln 2.4) L_{2,1}(x) + \sin(\ln 2.6) L_{2,2}(x)$$

$$E(x; f) = \frac{f'''(\xi(x))}{3!}(x-2)(x-2.4)(x-2.6)$$

$$f'(x) = \cos(\ln x) \cdot \frac{1}{x}$$

$$f''(x) = -\sin(\ln x) \cdot \left(\frac{1}{x}\right)^2 - \cos(\ln x)\left(\frac{1}{x}\right)^2$$

$$= -\left[\sin(\ln x) + \cos(\ln x)\right] \cdot \left(\frac{1}{x}\right)^2$$