No notes, books, cellular devices or graphing calculators are to be used.

1. (4.5 #9) Differentiate

\[ y = \ln x \cdot \ln 2x. \]

2. (4.5 #29) Find the coordinates of the relative extreme point for \( y = x^2 \ln x \) for \( x > 0 \). Then use the second derivative test to decide if the point is a relative maximum point or a relative minimum point.
3. (4.6 #25) Solve

\[
\ln x^4 - 2 \ln x = 1
\]

for \( x \).

4. (4.6 #49) Use logarithmic differentiation to differentiate

\[
f(x) = x^x.
\]