Name ________________________________

- Show sufficient work to justify each answer.
- No calculators, notes, books, etc allowed.
- This quiz has 3 questions. You have 15 minutes for this quiz.

1. (3 points) If 
   \[ y = (\ln x)^x \]
   find \(\frac{dy}{dx}\) in terms of \(x\).

2. (3 points) The position (in meters) of a particle at time \(t \geq 0\) is given by
   \[ s(t) = \frac{t^3}{3} - 2t^2 + 10t + 17 \]
   What is the particle’s acceleration when the particle’s velocity is 15 meters/second? Put units on your final answer.
3. (4 points) A population of rabbits is growing at a rate proportional to its size. At year 2, there are 20 rabbits, and at year 4, there are 120 rabbits. How fast is the rabbit population growing at year 10? Put units on your final answer.