5. [7 points] The Intern has designed an experiment to stabilize the highly radioactive compound Porcinate. In his experimental setup, the amount $P(t)$ of Porcinate in moles, t hours after the experiment began, should satisfy the differential equation

$$\frac{dP}{dt} - \frac{tP}{\ln(P)} = 0.$$

Use separation of variables to find a solution $P(t)$ satisfying $P(3) = e$.

6. [5 points] The Intern is also studying a compound called Bovinate. The amount $B(t)$ of Bovinate in moles, t hours after an experiment began, satisfies the differential equation

$$\frac{dB}{dt} = 2B(1-B)(t+B)^2.$$

a. [3 points] List all equilibrium solutions of the differential equation. Indicate whether each is stable or unstable.

b. [2 points] If the initial amount of Bovinate were 0.5 moles, what would happen to the amount of Bovinate in the long run?