

3. [15 points] A model for cell growth states that the volume $V(t)$ (in mm^3) of a cell at time t (in days) satisfies the differential equation

$$\frac{dV}{dt} = 2e^{-t}V.$$

- a. [2 points] Find the equilibrium solutions of this equation.
- b. [8 points] Solve the differential equation. The initial volume of the cell is $V_0 \text{ mm}^3$. Your answer should contain V_0 .
- c. [3 points] How long does it take a cell to double its initial size?
- d. [2 points] What happens to the value of the volume of the cell in the long run?