

Problem 1: (5 points) Consider the autonomous differential equation

$$\frac{dS}{dt} = S^2 - 4S + 4.$$

Make a rough sketch of the slope field and the graph of the solution with the initial condition $S(0) = 0$.

Problem 2: (5 points) Consider the initial value problem

$$\frac{dS}{dt} = S^2 - 4S + 4; \quad S(0) = 0.$$

Approximate $S(1)$ and $S(-1)$ using Euler's Method with a step size of $\Delta t = 1/2$.