Name

- Estimate parameters in the Lotka-Volterra model $\begin{array}{l} m' = \alpha m - \beta m w \\ w' = -\gamma w + \delta m w \end{array}$ for moose (m) and wolves (w). Plot the predictions of your model.

1. Show some reasoning to estimate birth and death rates for rabbits then write down and solve a simple ODE modeling an initially small population of rabbits $r(t)$ on a lush fertile island. Discuss the results.

- Solve $y' = 2y + e^t \quad y(0) = 1$

2. Solve $y' + 2ty = t e^{-t^2}$