

Problem 1: (5 points) Locate the bifurcation values for the one-parameter family of differential equations

$$\frac{dy}{dt} = f_\alpha(y) = (y^2 - \alpha)(y^2 - 4)$$

and draw the bifurcation diagram.

Problem 2: (5 points) Find the solution of the linear differential equation

$$\frac{dy}{dt} = -y + 6e^{2t}$$

with $y(0) = 3$.