

Problem 17

Consider the initial value problem

$$4y'' + 4y' + y = 0, \quad y(0) = 1, \quad y'(0) = 2.$$

- (a) Solve the initial value problem and plot the solution.
- (b) Determine the coordinates (t_M, y_M) of the maximum point.
- (c) Change the second initial condition to $y'(0) = b > 0$ and find the solution as a function of b .
- (d) Find the coordinates (t_M, y_M) of the maximum point in terms of b . Describe the dependence of t_M and y_M on b as b increases.