

Problem 25

Consider the initial value problem

$$y'' + 2y' + 6y = 0, \quad y(0) = 2, \quad y'(0) = \alpha \geq 0.$$

- (a) Find the solution $y(t)$ of this problem.
- (b) Find α such that $y = 0$ when $t = 1$.
- (c) Find, as a function of α , the smallest positive value of t for which $y = 0$.
- (d) Determine the limit of the expression found in part (c) as $\alpha \rightarrow \infty$.