

Problem 26

Consider the initial value problem

$$y'' + 2ay' + (a^2 + 1)y = 0, \quad y(0) = 1, \quad y'(0) = 0.$$

- (a) Find the solution $y(t)$ of this problem.
- (b) For $a = 1$ find the smallest T such that $|y(t)| < 0.1$ for $t > T$.
- (c) Repeat part (b) for $a = 1/4, 1/2$, and 2 .
- (d) Using the results of parts (b) and (c), plot T versus a and describe the relation between T and a .