

Problem 17

Consider a vibrating system described by the initial value problem

$$u'' + \frac{1}{4}u' + 2u = 2 \cos \omega t, \quad u(0) = 0, \quad u'(0) = 2.$$

- (a) Determine the steady state part of the solution of this problem.
- (b) Find the amplitude A of the steady state solution in terms of ω .
- (c) Plot A versus ω .
- (d) Find the maximum value of A and the frequency ω for which it occurs.