Part I Problems

**Problem 1:** A driven spring-mass-dashpot system is modeled by the DE

\[ m\ddot{x} + c\dot{x} + kx = F_0 \cos \omega t \]

with \( m = 1, c = 6, \) and \( k = 45 \). \( F_0 = 50 \). Find the amplitude \( A(\omega) \) of the response as a function of the input frequency \( \omega \) and find the frequency which gives the largest system response. Is this a system for which ‘practical resonance’ occurs?