1. Given: \( m = 2 \) (slugs), \( k = 200 \) (lb/ft)

   Under-damped system response
   System response using MATLAB

   Find: a) the decay rate of the oscillatory motion, and
   b) \( c \), the damping coefficient

2. Given: \( m = 2 \) (slugs), \( k = 200 \) (lb/ft), \( c = 5 \) (lb-s/ft)
   \( y(t = 0) = -0.25 \) (ft), \( v(t = 0) = -10 \) (ft/s)

   Find: \( y(t) \)
   Express the result as an exponential function times a single, phase-shifted sine function.

3. Given: \( m = 2 \) (slugs), \( k = 200 \) (lb/ft), \( c = 44 \) (lb-s/ft)
   \( y(t = 0) = -0.25 \) (ft), \( v(t = 0) = -10 \) (ft/s)

   Find: \( y(t) \)