ENGR 1990 Engineering Mathematics  
Lab/Recitation #1 – Application of Lines in Mechanical Engineering

1. Run Simulink/SimMechanics code for a car undergoing constant acceleration followed by constant deceleration. Pick off two velocity values during the acceleration phase and two velocity values during the deceleration phase.

   a) Write the equations of the lines describing the velocity during each of the two phases.
   b) Find the time when the acceleration stops and the deceleration begins.
   c) Find the time when the car comes to a stop.

2. Run the MATLAB code that gives two bending moment values on either side of a concentrated load on a simply supported beam. Given: \( P \) (load), \( L \) (length of beam), and measured values

   a) Write the equations of the lines describing the bending moment values on either side of the load.
   b) Find the location of the load.
   c) Find the maximum bending moment.