Name: _____

Section: _____

Date: _____

R·I·T School of Mathematical Sciences

Beam Deflection

MATH 211 - 01

A beam of length 12 m is embedded at $x = 0$ and free at the other end. A constant load of $w(x) = kEI$ is distributed along the beam where $k = 0.005$.

1. Set up the differential equation whose solution models the deflection of the beam.
2. Find all linearly independent solutions to the corresponding homogeneous equation.
3. Find the linear combination of linearly independent solutions.
4. Find the solution to the nonhomogeneous equation.
5. Write the general solution to the differential equation.
6. Solve the BVP.
7. Now, consider a distributed load of $w(x) = kEIx$. Find the new solution to the nonhomogeneous equation.
8. Write the new general solution to the differential equation.
9. Solve the BVP.
10. Suppose I came in and fixed the beam at $x = 12$ so that it is no longer free at either end. What would the deflection of the beam be now? (Use the load of $w(x) = kEIx$.)