**Homework Assignment #8  
Due: Tuesday, May 8 by 5:00 p.m.**(*Follow all homework submission requirements posted on myCourses!  
Please copy & paste all Matlab code into your Word document, in addition to any plots.*)

**Problem #1:**

A simply-supported beam has one end fixed by pin and rests on a roller on the other end as shown in the figure. The vertical deflection, *y*, of the beam at a point, *x*, which has the distributed load shown in the figure is given by the following equation.

The elastic modulus of the beam material is *E* = 70.0 x 109 N/m2. The length of the beam is *L* = 6.0 m. The moment of inertia of the beam is *I* = 9.19 x 10-6 m4. The distributed load gradient is *wo* = 800 N/m.

Plot the deflection of the beam, *y*, as a function of distance from the pinned end, *x*. Copy and paste both your plot and your Matlab code into your Word document for the homework submission.

***Question*:** What is the maximum deflection of the beam?

**Problem #2:**

Use Matlab to show that the Euler series given below approaches /6.

Create several arrays of different sizes to evaluate the summation for 10, 50, 100 & 200 terms and calculate the percent error for each case.

Create a simple table in your Word document to summarize the results (number of terms and percent error) and copy & paste your Matlab code into your Word document.

**Problem #3:**

Consider three geometrical shapes with a defining parameter, *a*: a sphere whose radius is *a*, a right equilateral triangular prism where both the sides of the base and the height are *a*, and a cube where each side has a length of *a*. For 10 uniformly-spaced values of *a* from *a* = 1 to *a* = 2, calculate the volume of each shape: *Vs*, *Vp*, *Vc*. Plot each volume vs. *a*, with all three curves on the same graph. Make sure that your graph is presentable, with all required elements.

Copy and paste your plot and your Matlab code into your Word document.