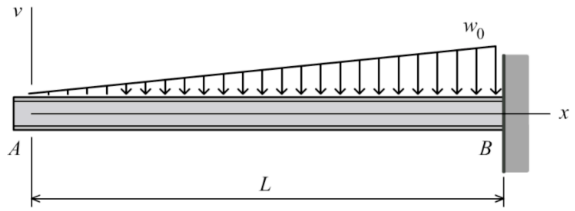
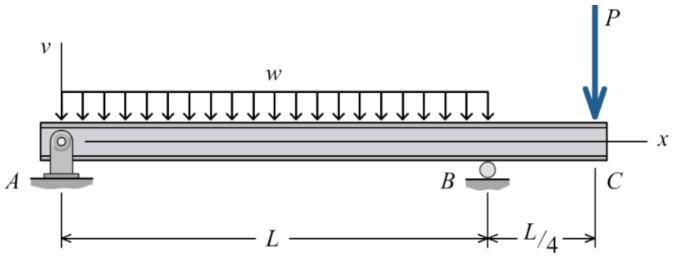
**CEE212 – Structural and Solid Mechanics**
**Winter Semester 2014-2015**
***Homework #9***
**(Due April 20, 2015)**

**Beam Deflections**

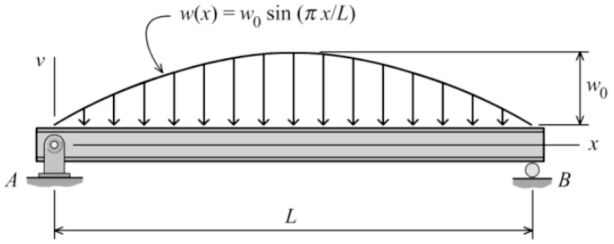
**Problem 1:** For the loading shown, use the double-integration method to determine (a) the equation of the elastic curve for the cantilever beam, (b) the deflection at the free end, and (c) the slope at the free end. Assume that *EI* is constant for each beam.



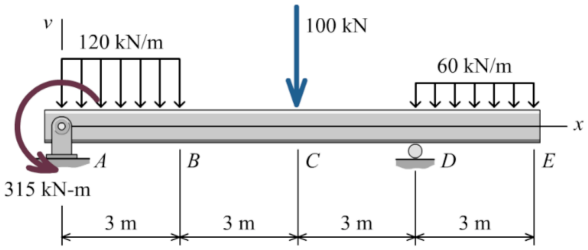

**Problem 2:** For the beam and loading shown use the double-integration method to determine (a) the equation of the elastic curve for segment AB of the beam, (b) the deflection midway between A and B, and (c) the slope at B. Assume that *EI* is constant for the beam.



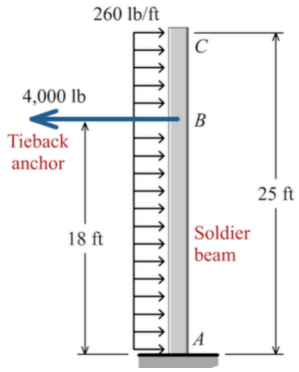

**Problem 3:** For the beam and loading shown integrate the load distribution to determine (a) the equation of the elastic curve, (b) the deflection midway between the supports, (c) the slope at the left end of the beam, and (d) the support reactions A and B. Assume that *EI* is constant for the beam.




**Problem 4:** The simply supported beam shown consists of a rectangular structural steel tube shape [$E$ = 200 GPa; $I = 350 \times 10^6$ mm$^4$]. For the loading shown, determine: (a) the beam deflection at point C, (b) the beam deflection at point E.



**Problem 5:** A 25-ft-long soldier beam is used as a key component of an earth retention system at an excavation site. The soldier beam is subjected to a uniformly distributed soil loading of 260 lb/ft, as shown. The soldier beam can be idealized as a cantilever with a fixed support at A. Added support is supplied by a tieback anchor at B, which exerts a force of 4,000 lb on the soldier beam. Determine the horizontal deflection of the soldier beam at point C. Assume $EI = 5 \times 10^8$ lb-in.$^2$.




**Problem 6:** For the beam and loading shown below, derive an expression for the reaction force at B. Assume that $EI$ is constant for the beam.