AEM 2011 Homework #11 (7.2, 7.3) Wednesday, April 4, 2023

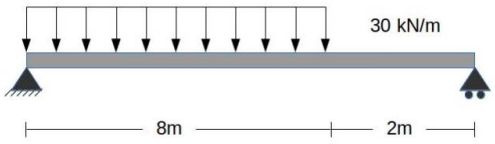
Unless otherwise mentioned, these problems should be solvable using a basic calculator. Practice clear communication by showing all work (free body diagrams, algebra, etc). This will be required to receive full credit on any graded problems.

1. Book problems:
   (a) *Use process from section 7.2*
      i. 7.35
      ii. 7.45
   (b) *Use process from section 7.3*
      i. 7.70
      ii. 7.78

   Additional Practice Problems: 7.31, 7.34, 7.42, 7.72

   The quiz problem will not be selected from these additional practice problems. However, these exercises contain important elements of the course and similar problems may appear on the exam.

2. Draw the shear force and bending moment diagram for the following beam. Determine the location and the magnitude of the maximum bending moment.



3. The Guthrie Theater, shown below (left), is located on the west bank of the Mississippi River. It includes a 178 foot bridge. Assume the bridge can be modeled as a cantilevered beam with the distributed load $w(x)$ as shown below (right). The distributed load is given by

   - $w(x) = w_0$ lb/ft for $0 \leq x \leq 150$ ft
   - $w(x) = w_0 \frac{178-x}{28}$ lb/ft for $150 < x \leq 178$ ft

   Where w_0 is a constant with the sign convention $w_0 > 0$ corresponding to the distributed load acting in the $-y$ direction as shown.

   Draw the shear and bending moment diagrams for the bridge