All assignments are to be submitted on engineering paper. You may use any type of engineering paper as long as it has a background grid. The example page below is for the paper available in the bookstore. If an alternate form of paper is used, the headings at the top of the page should be modified to match the printed partitions, however, the remainder of the instructions applies equally to either form.

Staple pages

Course Number

Assignment Number
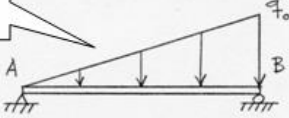
Name

Page numbers

CIVL 4122 | ASSIGNMENT # 4 | CAMP | 1/4

7o4-7 DERIVE THE EQUATION OF THE DEFLECTION CURVE FOR A SIMPLE BEAM SHOWN BELOW. DETERMINE MAXIMUM DEFLECTION δ_{max}.

Use a straight edge for all sketches, not just for the problem statement sketch

$q(x) = \dfrac{q_o x}{L}$

Engineering principles and assumptions require to work problem

$$EIv'''' = q = q_o \frac{x}{L} \qquad EIv''' = \frac{q_o x^2}{2L} + C_1$$

$$EIv'' = \frac{q_o x^3}{6L} + C_1 x + C_2$$

$$EIv' = \frac{q_o x^4}{24L} + C_1 \frac{x^2}{2} + C_2 x + C_3$$

Step-by-step solutions

$$EIv = \frac{q_o x^5}{120L} + C_1 \frac{x^3}{6} + C_2 \frac{x^2}{2} + C_3 x + C_4$$

BOUNDARY CONDITIONS: $v(0) = v(L) = 0 \qquad v''(0) = v''(L) = 0$

$$EIv''(0) = 0 = C_2 \qquad \underline{C_2 = 0} \qquad EIv(0) = 0 = C_4 \qquad \underline{C_4 = 0}$$

$$EIv''(L) = 0 = \frac{q_o L^2}{6} + C_1 L \qquad \underline{C_1 = -\frac{q_o L}{6}}$$

$$EIv(L) = 0 = \frac{q_o L^4}{120} + \left(-\frac{q_o L}{6}\right)\frac{L^3}{6} + C_3 L \qquad \underline{C_3 = \frac{7 q_o L^3}{360}}$$

$$\Rightarrow \quad v(x) = \frac{q_o x}{360 EIL}\left[7L^4 - 10L^2 x^2 + 3x^4\right]$$

Double underline answer with units

Use engineering paper

Work should be done in pencil, and a lead hardness used which produces good contrast to the paper. Figures should be drawn with a straight edge and if appropriate, a circle template or compass. The layout and appearance of your work should be of professional quality. Work no more than one problem per page. Do not use the back of a page for any reason. All pages should be ordered by page number and stapled. A good guide for this standard is to prepare each assignment as if it were to be kept on file and sent to prospective employers as an example of your work at University of Memphis.

Homework is due at the beginning of class on the due date. **Late homework will not be accepted for any reason.** To account for a missed assignment, even with a valid excuse, one homework assignment will be dropped for consideration in computing the homework average.