University of Maryland   Fall 2017

ENCE353: Introduction to Structural Analysis   Due in Class on: 11/01/2017(Wednesday)
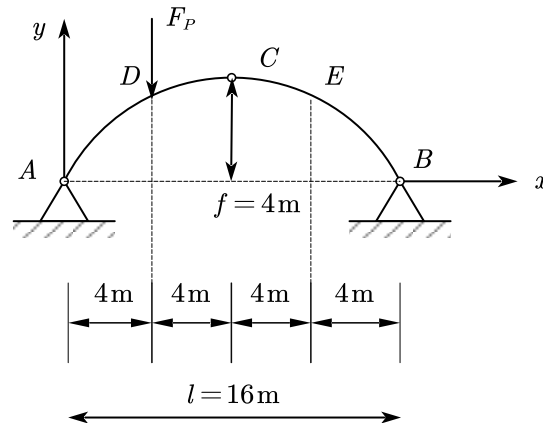
Homework #3

Problem 1: For the three-pin arc structure shown below, the profile is given by $y = \dfrac{4f}{l^2}x(l-x)$, where $f = 4$ m and $l = 16$ m.

(a) Calculate the reactions at A and B;

(b) Calculate the internal forces at point E (i.e. axial force F_N, shear force F_Q and bending moment M);

(c) Draw the moment diagram.

Problem 2 The cable structure shown below carries a triangular load that is zero at the left-hand support and increases to wo N/m at the right-hand support.
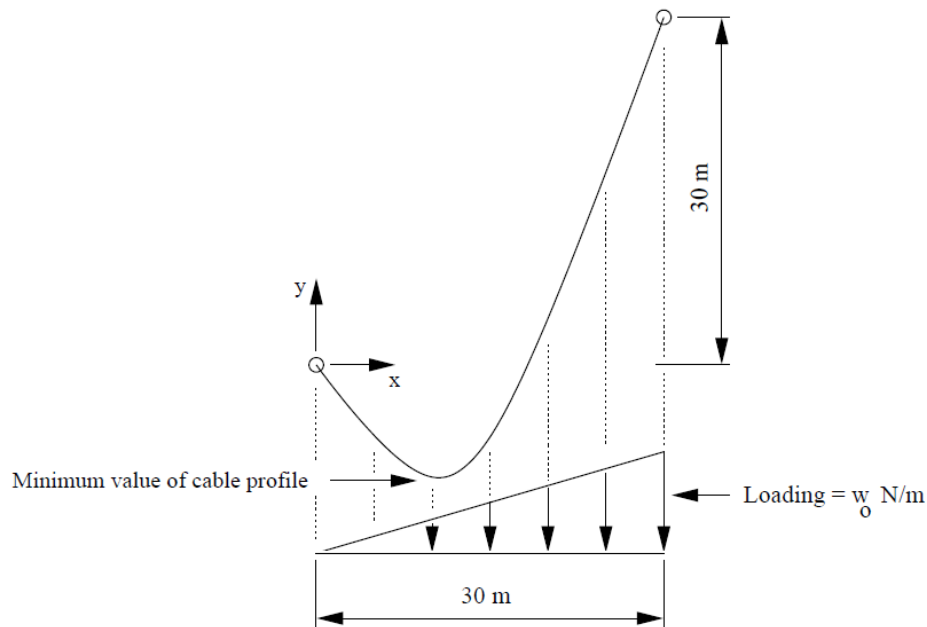
(a) Prove that the cable profile is govern by the equation:

$$y(x) = \frac{w_0 x^3}{180H} + \left(1 - \frac{5w_0}{H}\right)x$$

(b) Assume, the minimum value of the cable profile occurs at x=10 m, calculate the reactions at both ends.