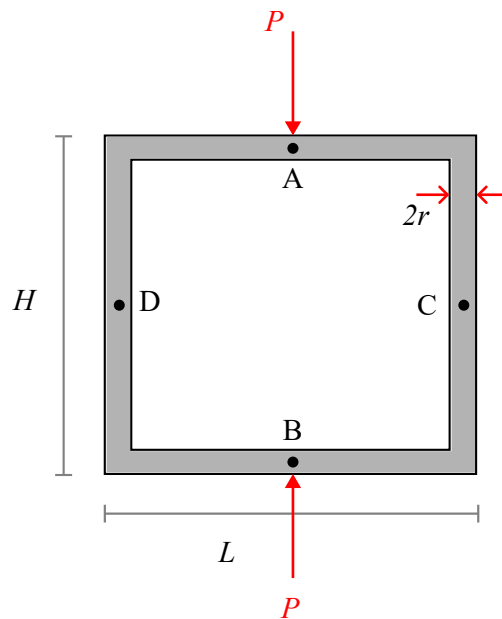# Tutorial 11

APL 104 - 2022 (Solid Mechanics)

1. Think of a rectangular beam as shown. Asusme its cross-section to be solid circular. Suppose the ring is subjected to equal and opposite forces at 'A' and 'B'. Neglect energy in the beam's cross-section due to shear force and axial force.

   (a) By how much will points A and b get closer to each other?

   (b) By how much will points C and D get farther apart?

   (c) What is internal moment in the cross-section at C?

2. Using energy method, determine (i) the vertical deflection of point B under the action of load W and (ii) the horizontal reaction force at B. The end B is free to rotate but can move only in a vertical direction. Consider all forms of energy, i.e. bending, twisting, stretching as well as shearing energy.
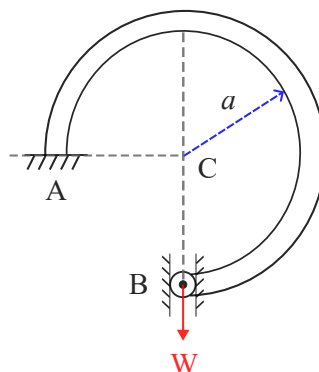
3. Determine the support reaction for the propped cantilever.
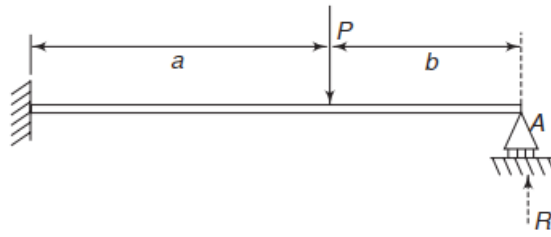
4. For the structure shown, what is the vertical deflection at end A? Also, determine the ratio of L to r if the horizontal and vertical deflections of the loaded end A are equal. P is the only force acting