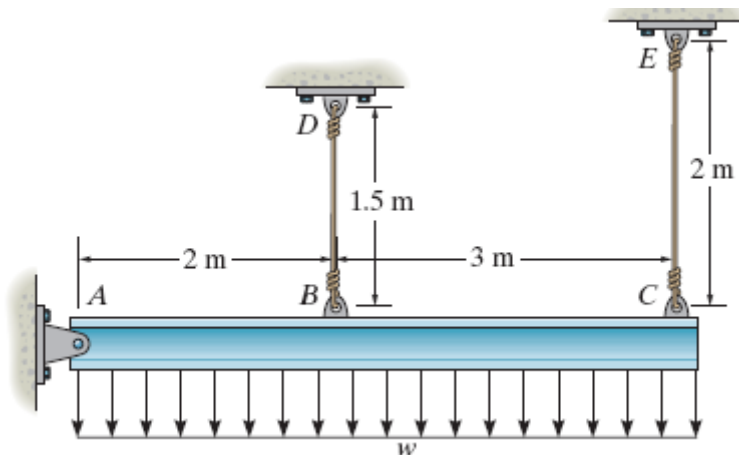


CHAPTER 2&3- STRAIN & MECHANICAL PROPERTIES OF MATERIALS

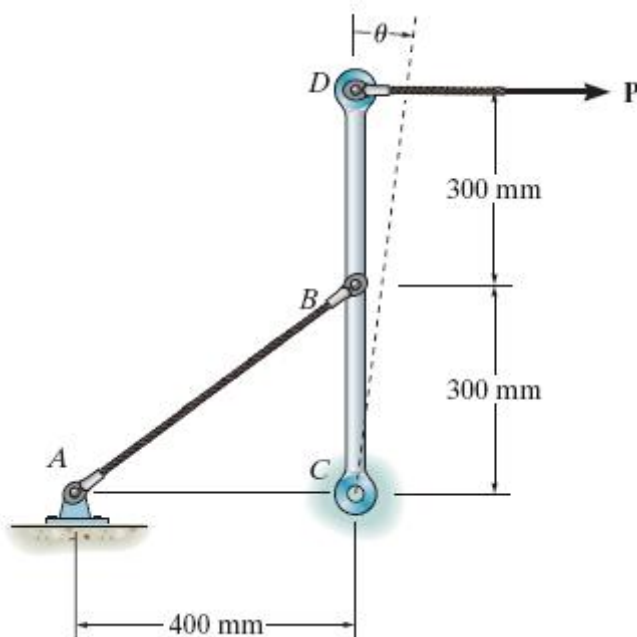
1- The rigid beam is supported by a pin at A and wires BD and CE . If the distributed load causes the end C to be displaced 10 mm downward, determine the normal strain developed in wires CE and BD .

(0.00267 mm/mm, 0.005 mm/mm)



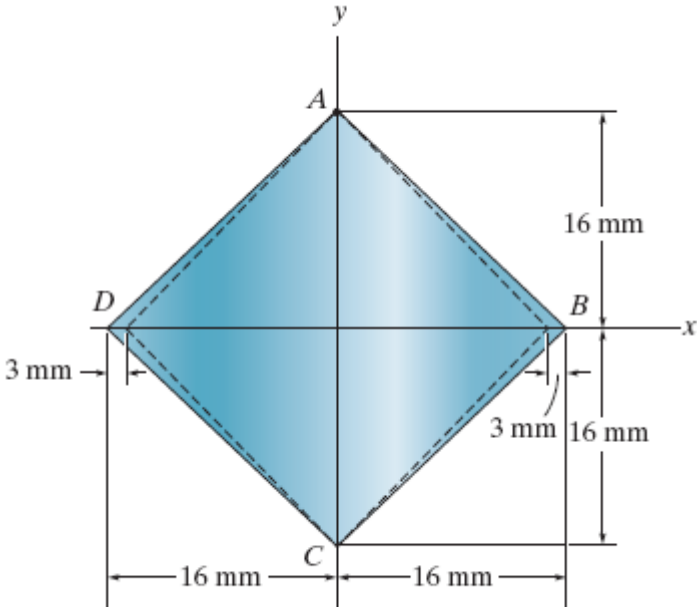
2- Part of a control linkage for an airplane consists of a rigid member CBD and a flexible cable AB . If a force is applied to the end D of the member and causes a normal strain in the cable of 0.0035 mm/mm, determine the displacement of point D . Originally the cable is unstretched.

(4.38 mm)



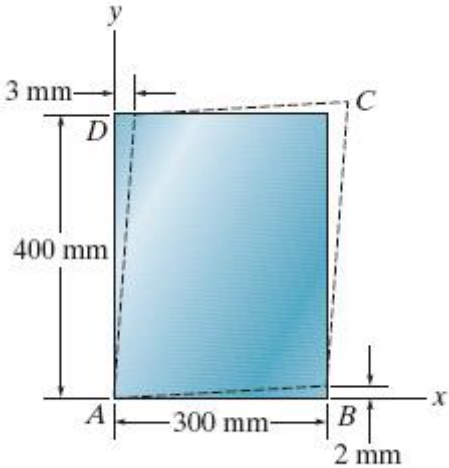
3- The corners B and D of the square plate are given the displacements indicated. Determine the shear strains at A and B .

(0.206 rad, -0.206 rad)



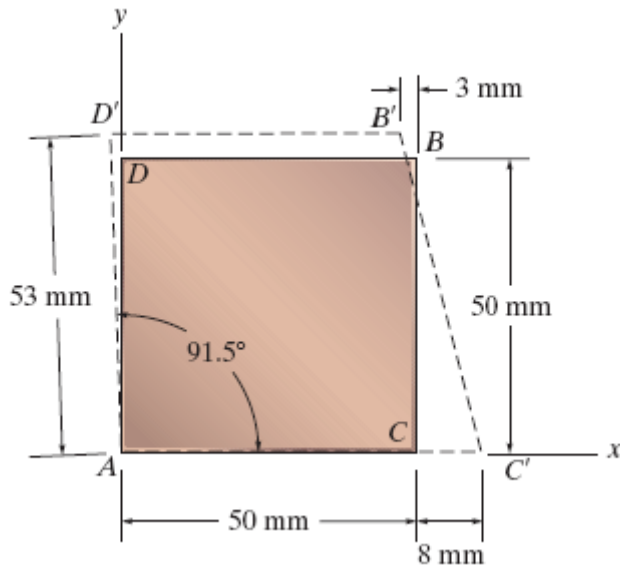
4- The piece of rubber is originally rectangular and subjected to the deformation shown by the dashed lines. Determine the average normal strain along the diagonal DB and side AD .

(-0.00680 mm/mm, 0.0281(10⁻³) mm/mm)



5- The square deforms into the position shown by the dashed lines. Determine the average normal strain along each diagonal, AB and CD . Side $D'B'$ remains horizontal.

(1.61x10⁻³ mm/mm, 126 10⁻³ mm/mm)



6- The acrylic plastic rod is 200 mm long and 15 mm in diameter. If an axial load of 300 N is applied to it, determine the change in its length and the change in its diameter. $E_p = 2.70 \text{ GPa}$, $\nu_p = 0.4$.

(0.126 mm, 0.126 mm)

