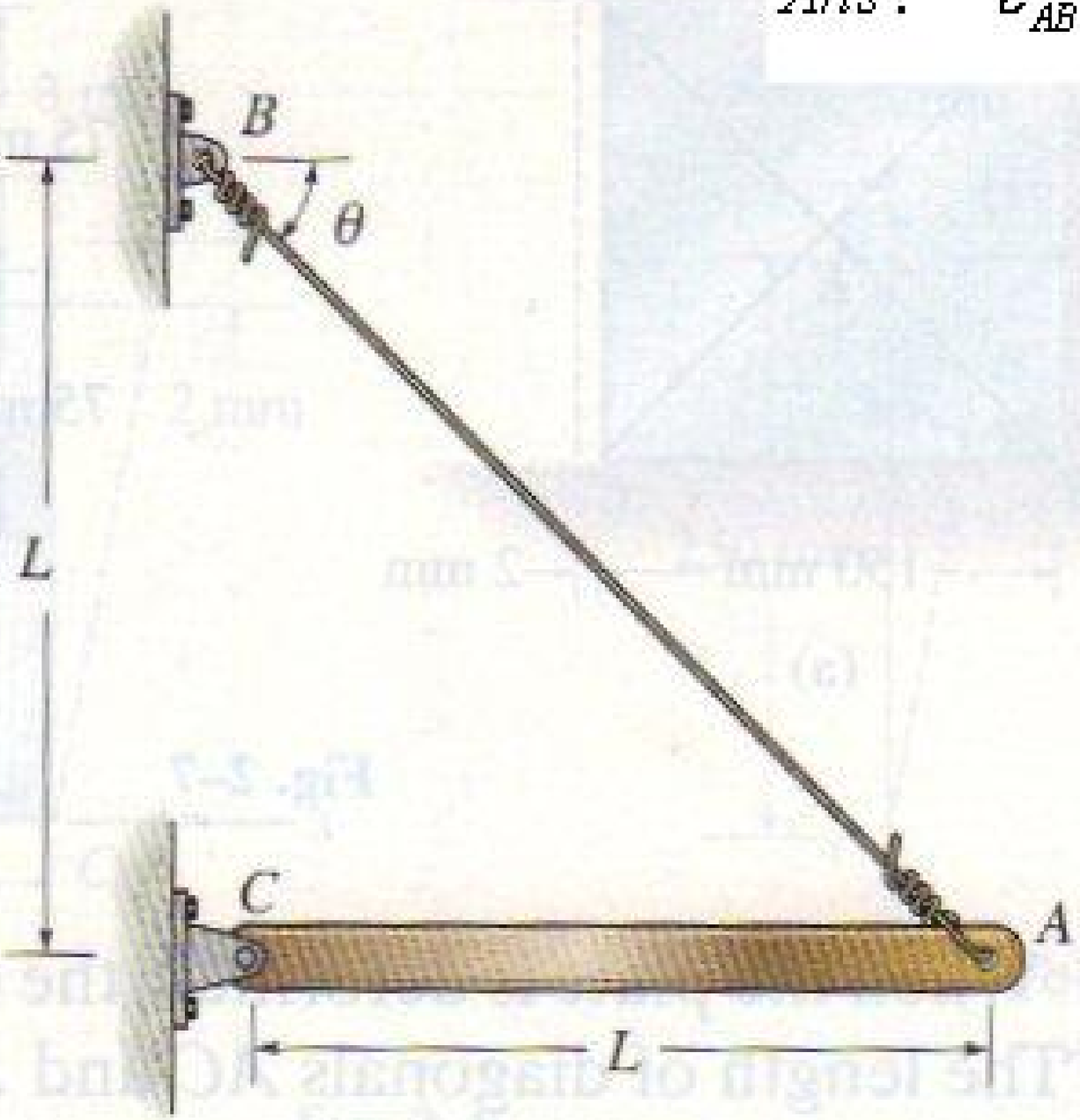
2-6. If a load applied to bar AC causes point A to be displaced to the right by an amount ΔL, determine the normal strain in wire AB. Originally, $\theta = 45°$.

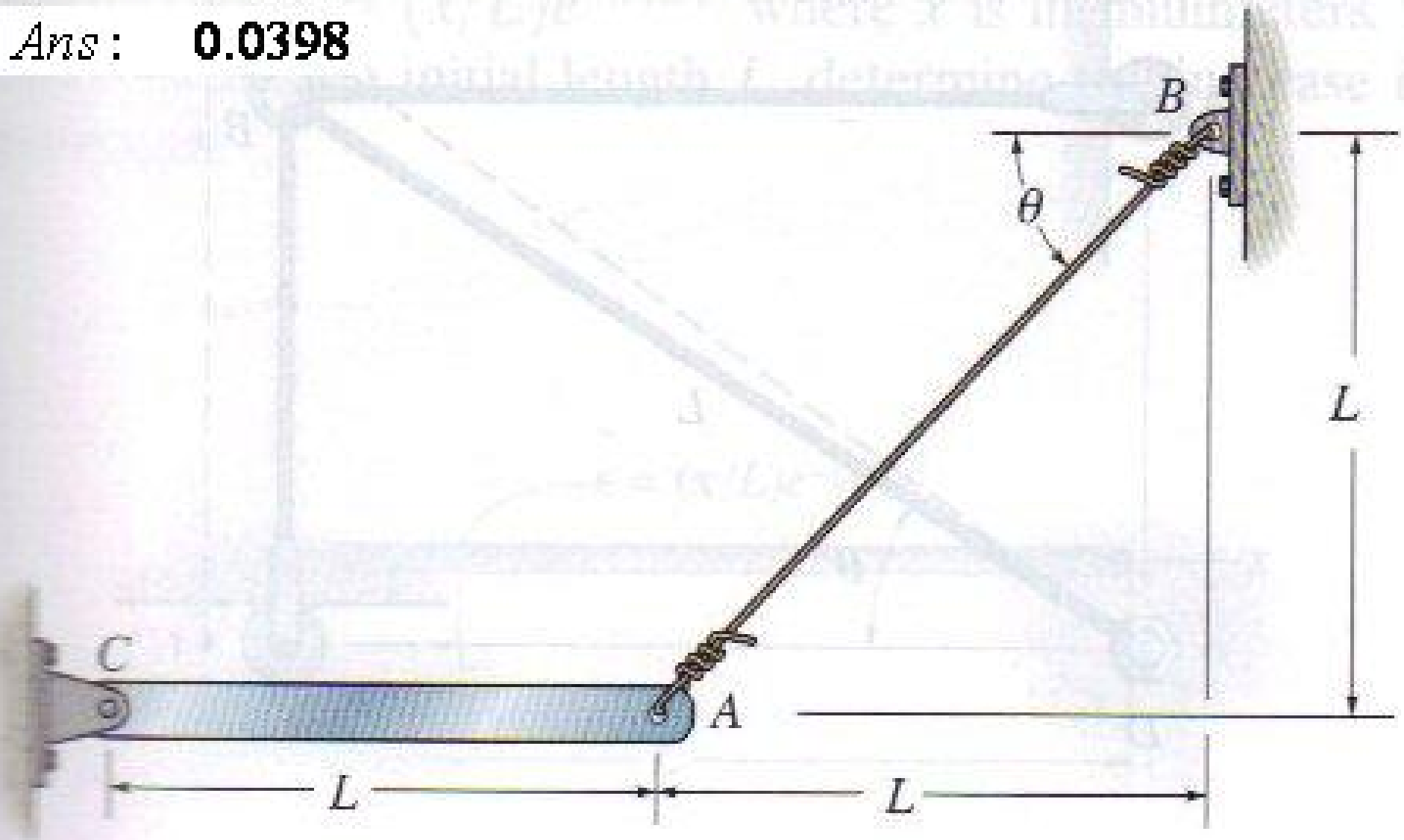
$$Ans: \quad \varepsilon_{AB} = \frac{0.5\Delta L}{L}$$



Probs. 2–5/6

2-10. The wire AB is unstretched when $\theta = 45°$. If a vertical load is applied to bar AC, which causes $\theta = 47°$, determine the normal strain in the wire.

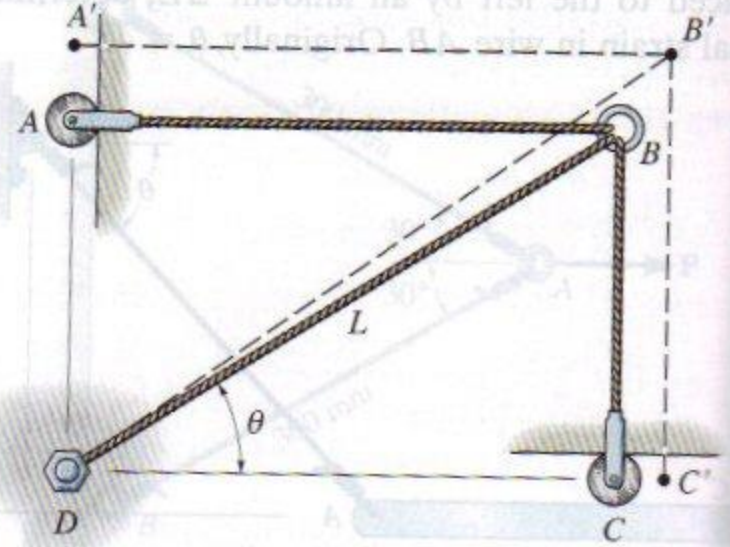
Ans: **0.0398**



Probs. 2–10/11

2-19. The three cords are attached to the ring at B. When a force is applied to the ring it moves it to point B', such that the normal strain in AB is ϵ_{AB} and the normal strain in CB is ϵ_{CB}. Provided these strains are small, determine the normal strain in DB. Note that AB and CB remain horizontal and vertical, respectively, due to the roller guides at A and C.

Ans: $\varepsilon_{DB} = \varepsilon_{AB}\cos^2\theta + \varepsilon_{CB}\sin^2\theta$

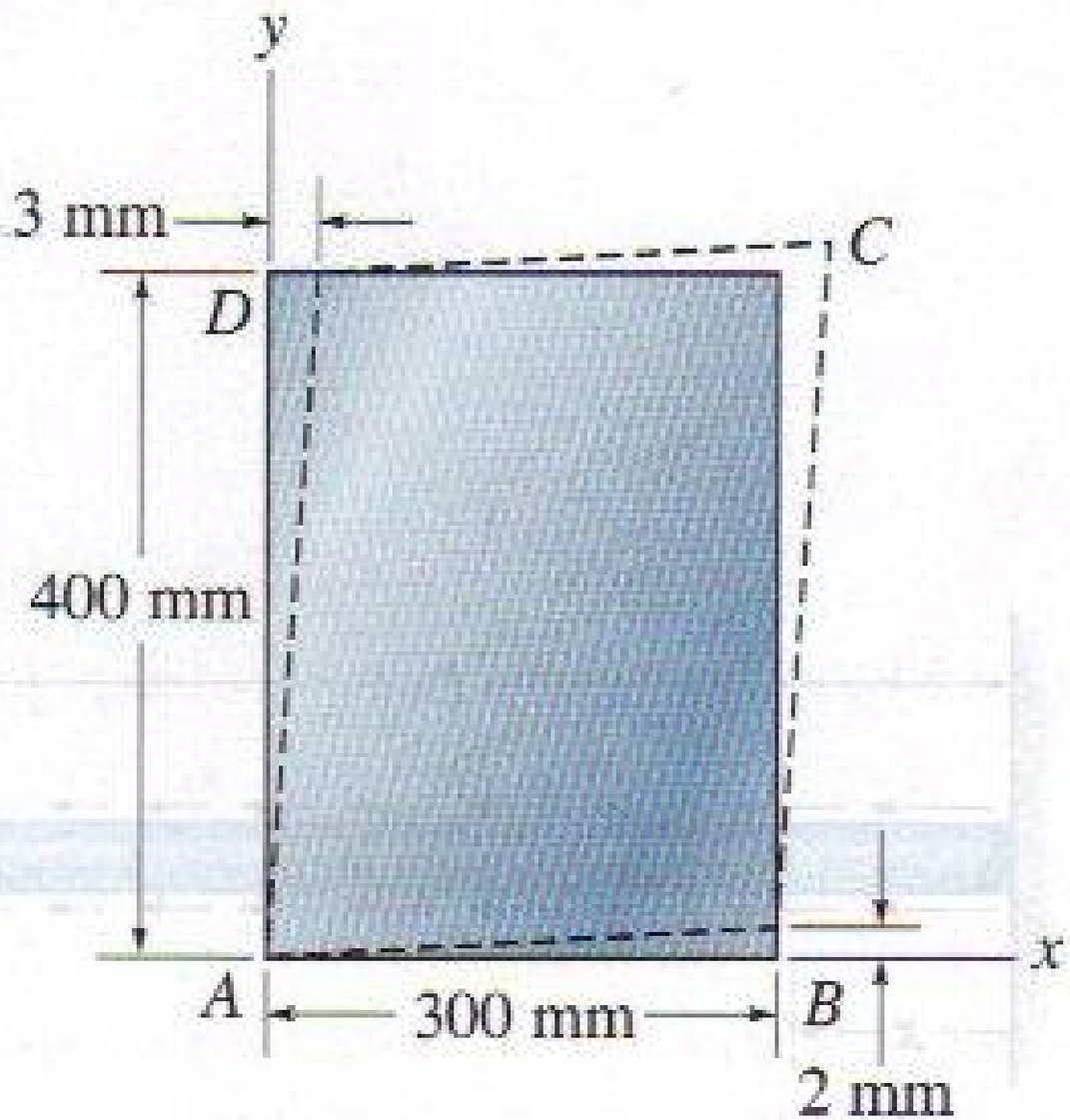


Prob. 2–19

2-26. 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.

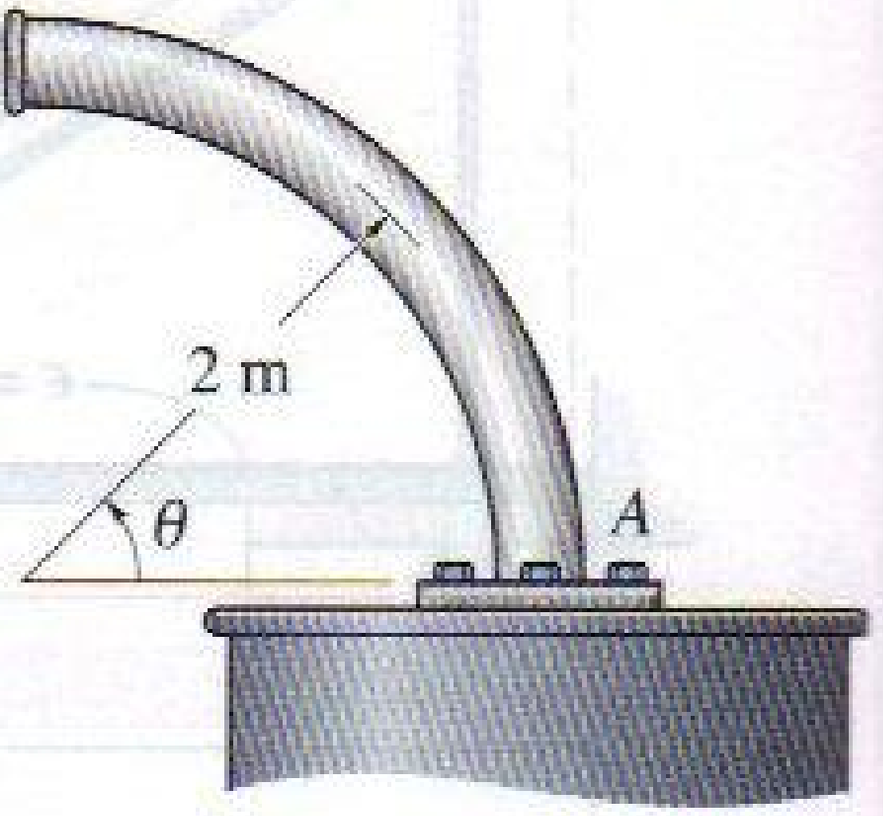
Ans: $\varepsilon_{DB} = -\mathbf{6.80} \times \mathbf{10}^{-3}\, mm/mm$

$\varepsilon_{AD} = \mathbf{2.81} \times \mathbf{10}^{-5}\, mm/mm$



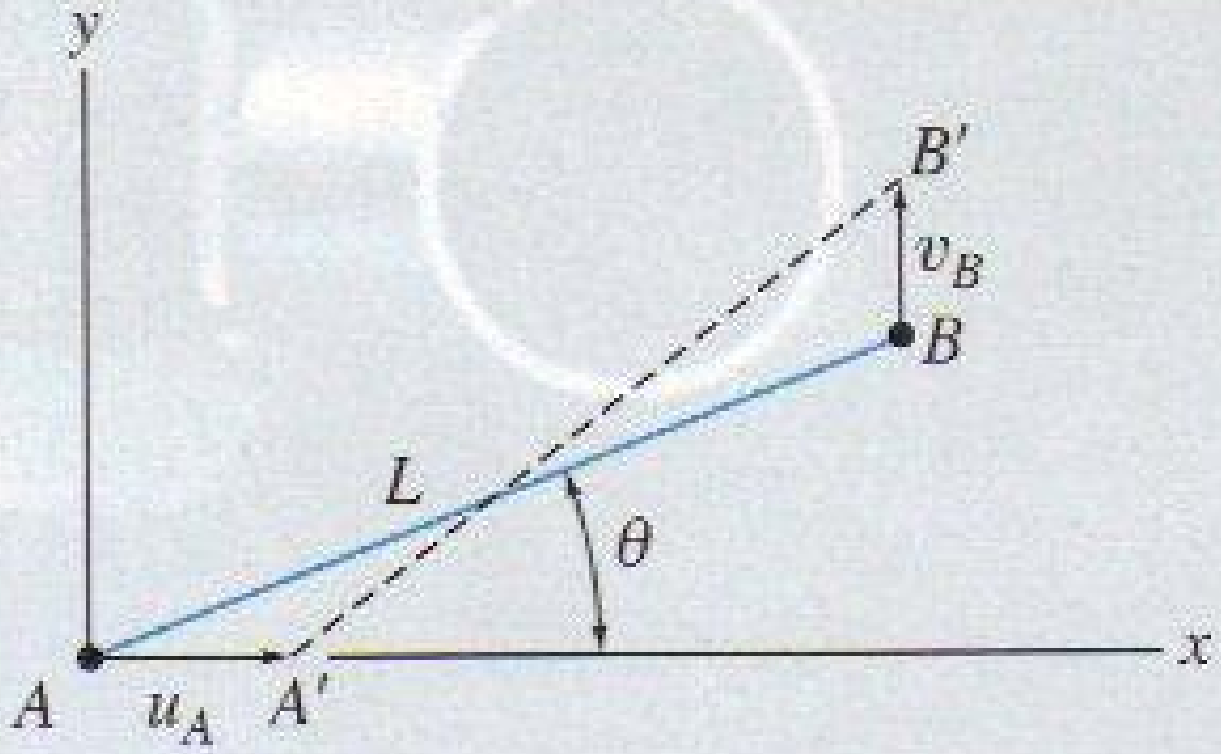
Probs. 2–25/26

2-31. The curved pipe has an original radius of 2 m. If it is heated nonuniformly, so that the normal strain along its length is $\epsilon = 0.05 \cos \theta$, determine the increase in length of the pipe. Ans: 0.10 m



Probs. 2–31/32

2-34. The fiber AB has a length L and orientation θ. If its ends A and B undergo very small displacements u_A and v_B, respectively, determine the normal strain in the fiber when it is in position $A'B'$.



Ans: $\varepsilon_{AB} = \dfrac{v_B \sin\theta}{L} - \dfrac{u_A \cos\theta}{L}$