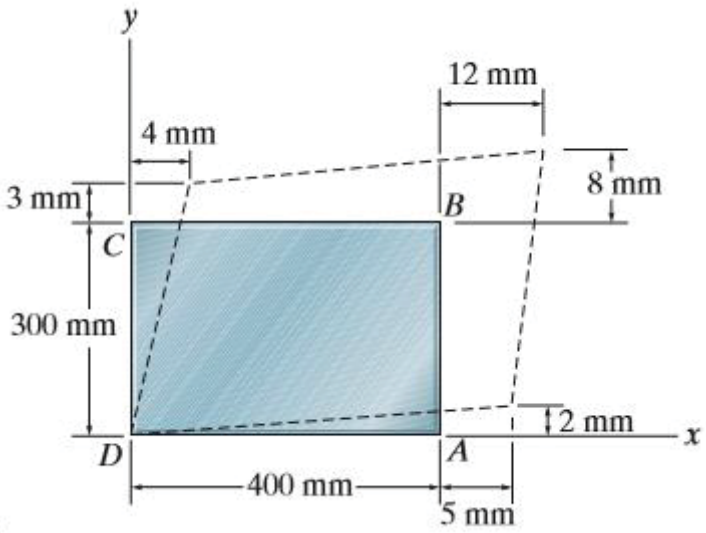
- Homework3: 2-11, 2-27, 2-30, 3-7, 3-25, 3-29, 3-33

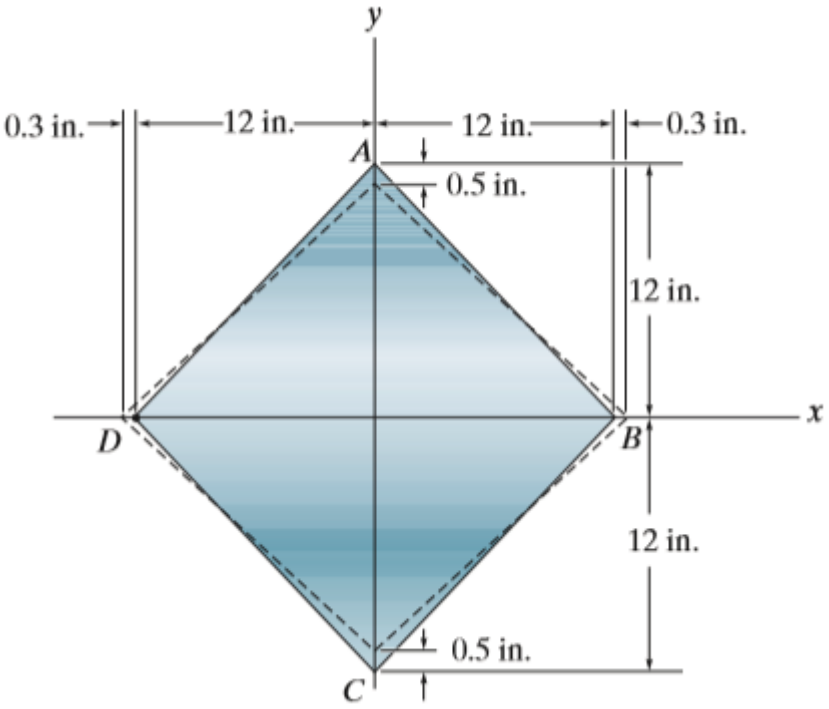
2–11.

Determine the shear strain γ_{xy} at corners D and C if the plastic distorts as shown by the dashed lines.



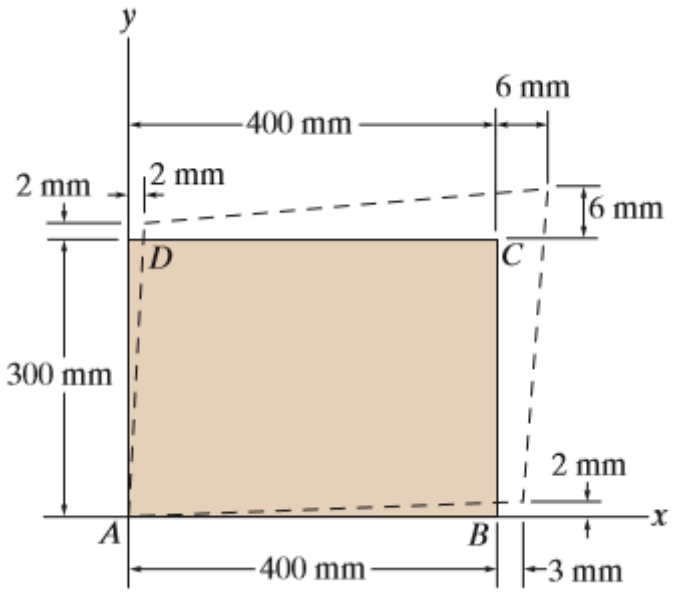
2–27.

The corners of the square plate are given the displacements indicated. Determine the average normal strains along side AB and diagonals AC and BD.



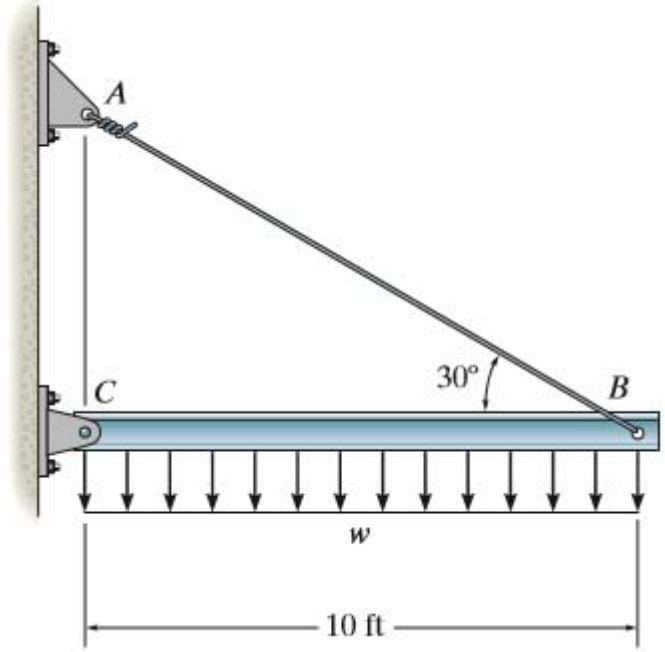
2–30.

The rectangular plate is deformed into the shape shown by the dashed lines. Determine the average normal strain along diagonal BD, and the average shear strain at corner B relative to the x, y axes.



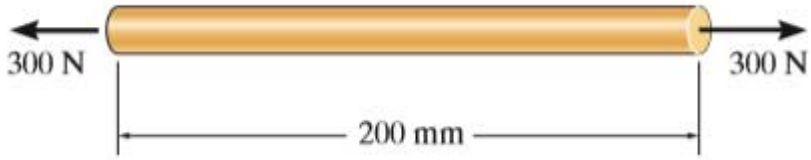
3–7.

The rigid beam is supported by a pin at C and an A-36 steel guy wire AB. If the wire has a diameter of 0.2 in., determine how much it stretches when a distributed load of $w = 100$ lb/ft acts on the beam. The material remains elastic.



3–25.

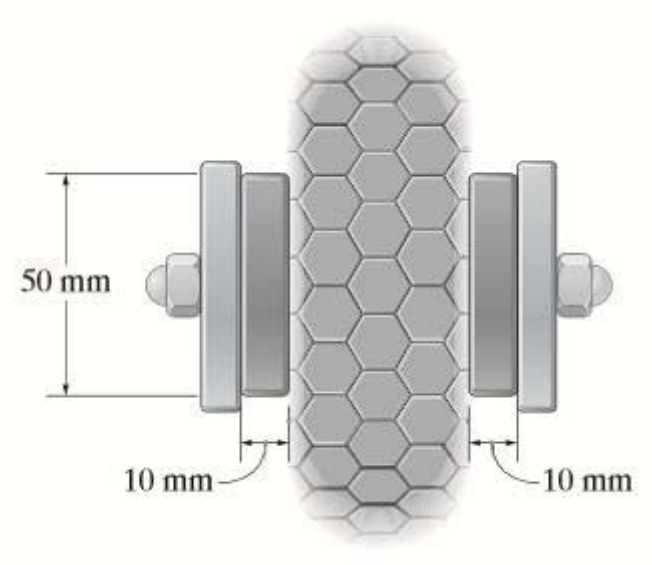
The acrylic plastic rod is 200 mm long and 15 mm in diameter. If an axial load of 300 N is applied to it, determine the change in its length and the change in its diameter. $E_p = 2.70$ GPa, $\nu_p = 0.4$.



Hint: Modulus of Elasticity E for A-36 steel is $29(10^3)$ ksi

3–29.

The brake pads for a bicycle tire are made of rubber. If a frictional force of 50 N is applied to each side of the tires, determine the average shear strain in the rubber. Each pad has cross-sectional dimensions of 20 mm and 50 mm. $G_r = 0.20$ MPa.



3–33.

The shear stress–strain diagram for an alloy is shown in the figure. If a bolt having a diameter of 0.25 in. is made of this material and used in the lap joint, determine the modulus of elasticity E and the force P required to cause the material to yield. Take $\nu = 0.3$.