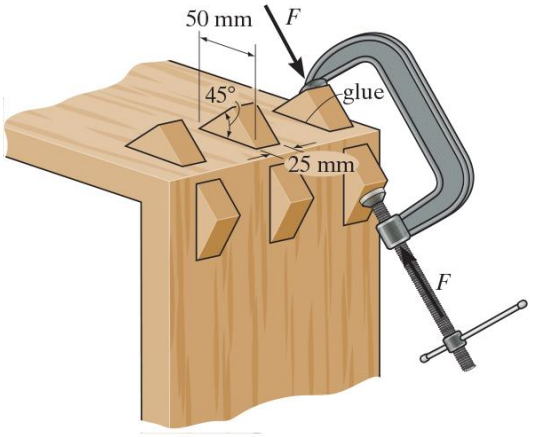
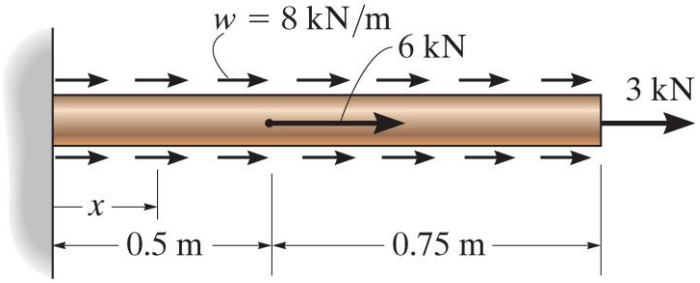
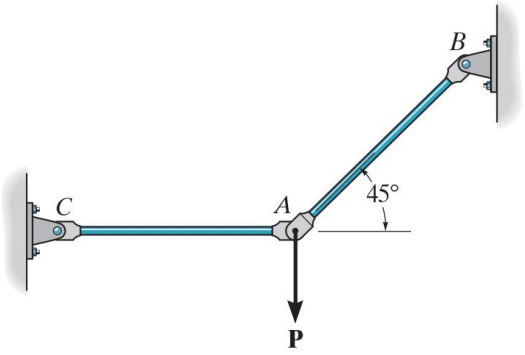
1. The triangular blocks (三角形塊) are glued (膠黏) along each side of the joint. A C-clamp (C 形夾) placed between two of the blocks is used to draw the joint tight (夾緊接合). If the clamping force (夾緊力) is F=900 N, <u>determine the average shear stress developed in the glued shear plane</u>. [15%] Ans:509 kPa.



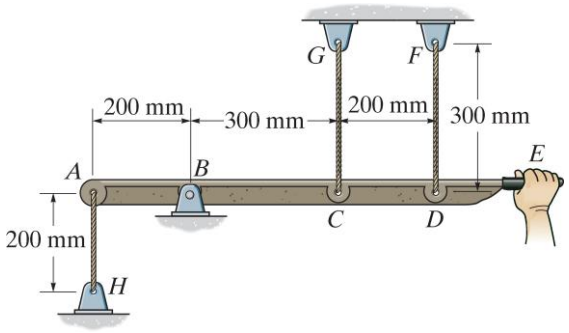
2. The bar has a cross-sectional area of $400(10^{-6})$ m^2. If it is subjected to a uniform (均勻) axial distributed loading along its length and to two concentrated (集中) loads, <u>determine the average normal stress in the bar as a function of x</u> for $0.5 < x \le 1.25$ m. [17%] Ans:32.5-20x MPa.



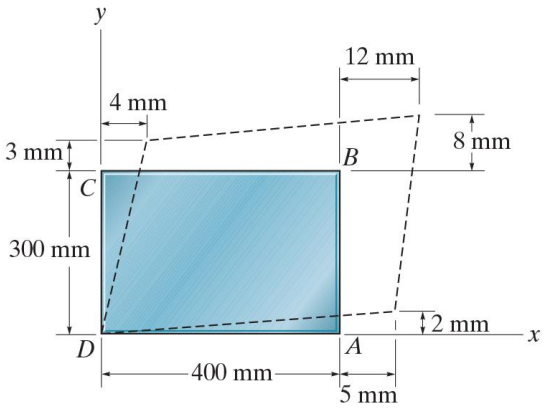
3. The two aluminum (鋁) rods *AB* and *AC* have diameters of 10 mm and 8 mm, respectively. <u>Determine the largest vertical force **P**</u> that can be supported. The allowable tensile stress for the aluminum is $\sigma_{allow} = 150$ MPa. [18%] Ans:7.54 kN.



4. The force applied at the handle of the rigid lever (剛體槓桿) causes the lever to rotate clockwise (順時針旋轉) about the pin *B* through an angle of 2^0. Determine the average normal strain in each wire. The wires are unstretched (未拉抻) when the lever is in the horizontal position. [15%] Ans:0.0349,0.0349,0.0582.



5. Determine the shear strain at corners *A* and *B* if the plastic distorts (歪曲) as shown by the dashed lines (虛線). [15%] Ans: $27.8(10^{-3})$, $35.1(10^{-3})$ rad



6. The nonuniform loading causes a normal strain in the shaft that can be expressed as $\varepsilon_x = k\sin\left(\frac{\pi}{L}x\right)$, where *k* is a constant. Determine the displacement of the center *C* and the average normal strain in the entire rod. [20%] Ans: kL/π, $2k/\pi$