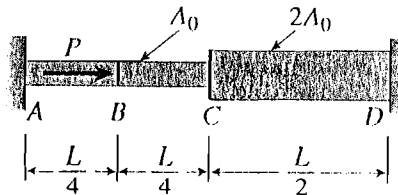
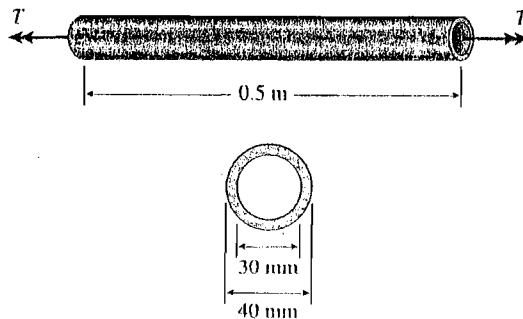


准帶項目請打「V」	
V	簡單型計算機

- Describe and explain the following terms: (a) 0.2% offset yielding strength, (b) stress concentration. (20%)
- A cylindrical steel specimen is subjected to a stress of 100 MPa. The undeformed specimen has a diameter of 10 mm and a length of 40 mm. The length and diameter of the deformed specimen are 40.019 mm and 9.9986 mm, respectively. Assuming the specimen remained elastic, calculate the (a) elastic modulus, and (b) shear modulus for this steel. (20%)
- The axially loaded bar  $ABCD$  shown in the following figure is held between rigid supports. The bar has cross-sectional area  $A_0$  from  $A$  to  $C$  and  $2A_0$  from  $C$  to  $D$ . (a) Obtain formulas for the reactions  $R_A$  and  $R_D$  at the ends of the bar. (b) Determine the displacements  $\delta_B$  and  $\delta_C$  at the points  $B$  and  $C$ , respectively. (20%)



- A circular tube of aluminum is subjected to torsion by torques  $T$  applied at the ends. The bar is 0.5m long, and the inside and outside diameters are 30 mm and 40 mm, respectively. It is determined by measurement that the angle of twist is  $3.57^\circ$  when the torque is 600 Nm. Calculate (a) the maximum shear stress  $\tau_{max}$  in the tube, and (b) the shear modulus of elasticity  $G$ . (20%)



- Find the (a) shear force  $V$  and (b) bending moment  $M$  at a section located 16 ft from the left-hand end  $A$  of the beam with an overhanging shown in the figure. (20%)

