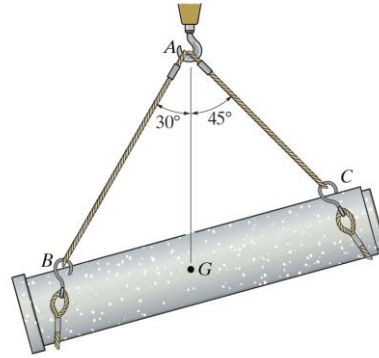
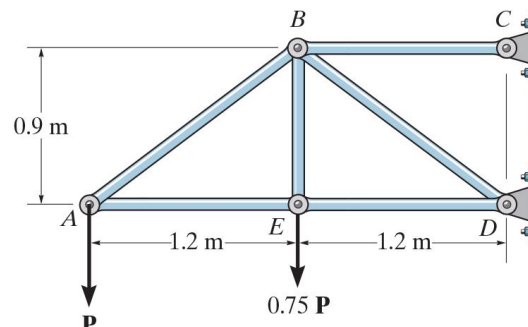


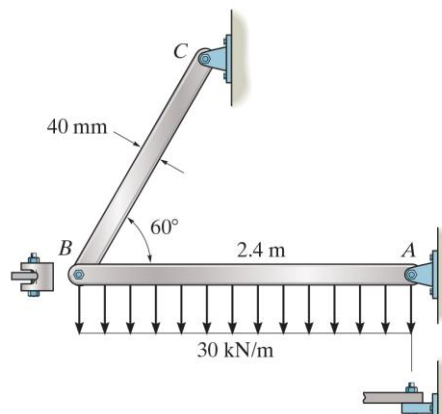
1. The 2-Mg concrete pipe has a center of mass at point G . If it is suspended from cables AB and AC , determine the average normal stress in the cables. The diameters of AB and AC are 12 mm and 10 mm, respectively. [15%] Ans: 127, 129 MPa



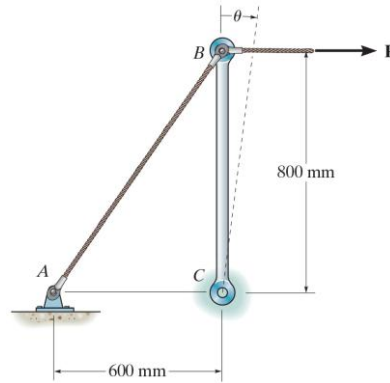
2. The bars of the truss each have a cross-sectional area of 780 mm^2 . If the maximum average normal stress in any bar is not to exceed 140 MPa, determine the maximum magnitude P of the loads that can be applied to the truss. [15%] Ans: 29.8 kN



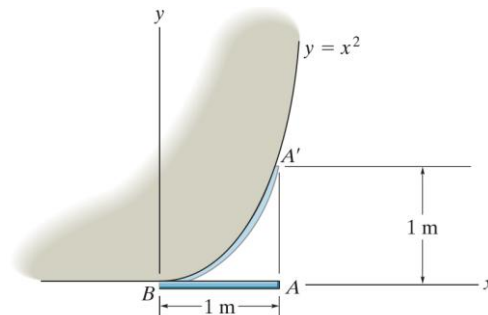
3. Determine the required thickness of member BC and the diameter of the pins at A and B to the nearest mm (最接近的 mm) if the allowable normal stress for member BC is $\sigma_{allow} = 200 \text{ MPa}$ and the allowable shear stress for the pins is $\tau_{allow} = 70 \text{ MPa}$. [20%] Ans: 6, 28, 20 mm



4. Part of the control linkage (連結) for an airplane consists of a rigid member CB and a flexible cable AB . If a force is applied to the end B of the member and caused it to rotate by $\theta = 0.5^\circ$, determine the normal strain in the cable. Originally the cable is unstretched. [15%] Ans: 0.00418



5. The rubber band (帶) AB has an unstretched length of 1 m. If it is fixed at B and attached to the surface at point A' , determine the average normal strain in the band. The surface is defined by the function $y = x^2$ m, where x is in meters. [15%] Ans: 0.479



6. The material distorts into the dashed (虚線) position shown. (a) Determine the average normal strains ϵ_x , ϵ_y and the shear strain γ_{xy} at A , and average normal strain along line BE . (b) Determine the average normal strains along the diagonals AD and CF . [20%] Ans: (a) 0, 0.0018, 0.0599, -0.0198 (b) 0.0566, -0.0255

