

1. A straight uniform bar weighing 60 lb rests in a horizontal position against two frictionless slopes as shown in Figure 1. A concentrated vertical load of 200 lb acts at a distance x from the right end of the bar as shown. Find the distance x for equilibrium. (20%)

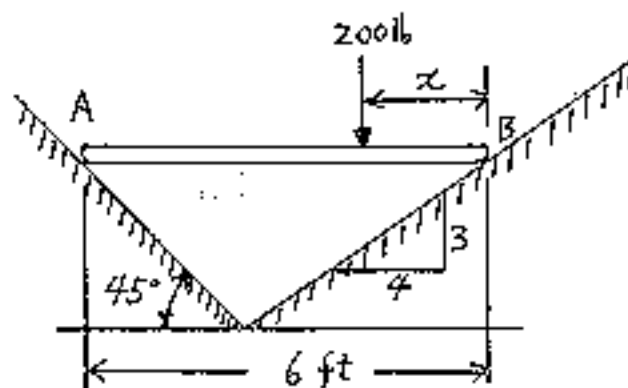


Fig. 1

2. Rod ABCD in Figure 2 rests against rollers at B and C, and against a smooth surface at A. Find the angle α so the roller at B may be removed. (20%)

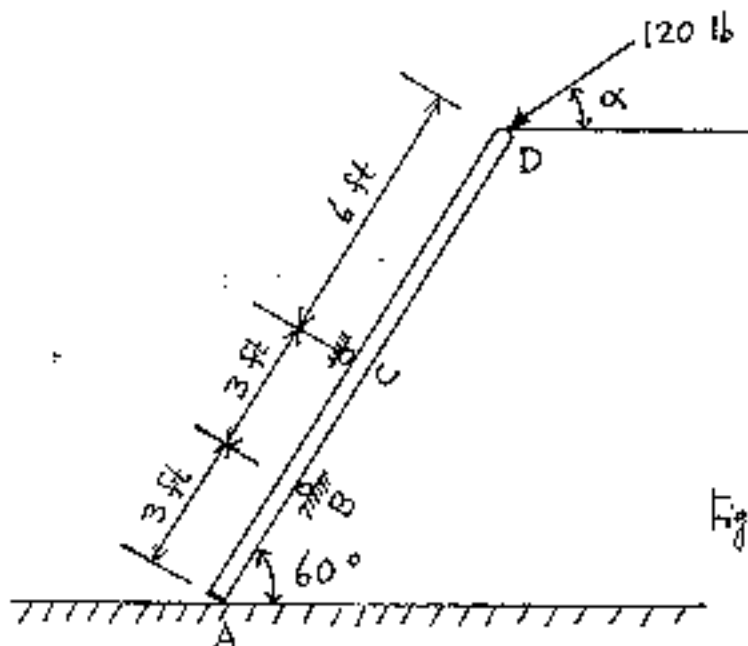


Fig. 2.

(背面仍有題目,請繼續作答)

3. In Figure 3 find the reactions at the hinge supports A and B. (20%)

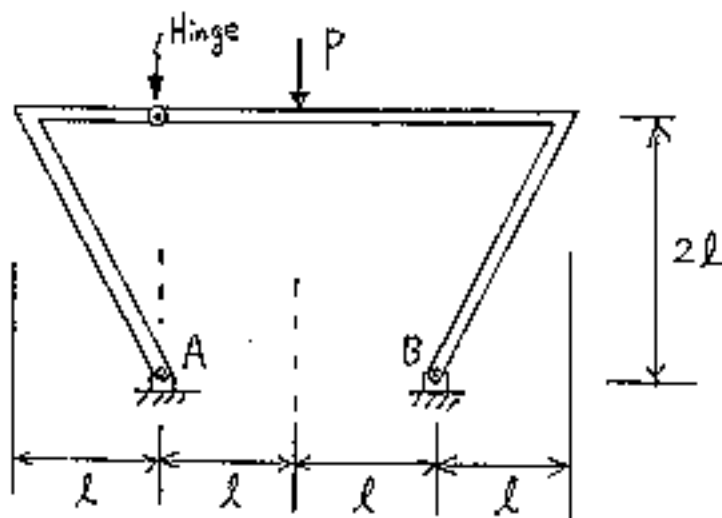


Fig. 3.

4. In Figure 4 the uniform rod has weight W and rests on supports as shown, with $b > a$. Draw the shear and bending moment diagrams and show that the largest bending moment is at B if $a\sqrt{2} > b$. (20%)

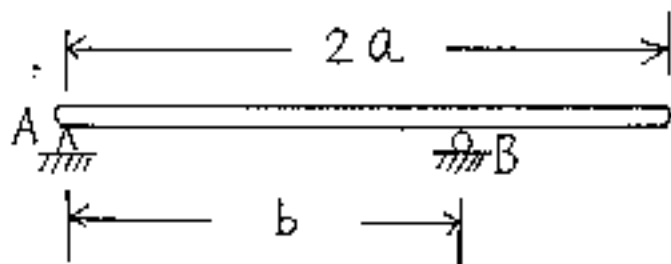


Fig. 4.

5. Find the force P (see Figure 5) for which the 200 lb block A will be on the verge of sliding upward. The wedge B weighs 50 lb. (20%)

