**壹、　應用力學（50分）**

一、　如圖1所示，一個12公尺（m）長，1000牛頓（N）重之橫
　　樑 AB，停靠在 C 和 D 支點上，但並未接合在一起。

　　〈1〉如欲使該橫樑維持在平衡狀態下，則 P 值範圍應為多少？（該
　　　　樑質料均勻）（10分）

　　〈2〉若已知 P=6700N，則其平衡狀態是否會發生改變？（3分）
　　　　假設已改變，則欲移動 D 之位置，那麼究竟該移向 A 點或
　　　　移向 B 點？（3分）
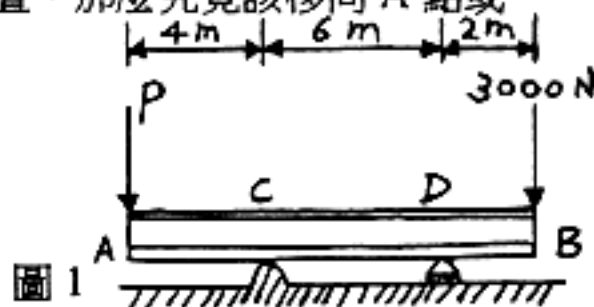


圖 1

二、　如圖2所示，已知 P 對 x 和 z 軸之力矩分別為 $M_x = -224\,N \cdot m$，
　　$M_z = -200\,N \cdot m$，試決定 $\theta$ 之角度？（以度度量表示）（10分）
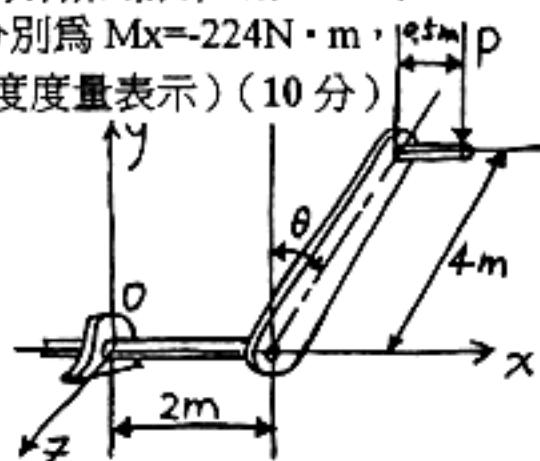


圖 2

三、　如圖3所示，試求該機械元件之重心位置？（該兩個洞之直
　　徑均為 1 英吋）（12分）
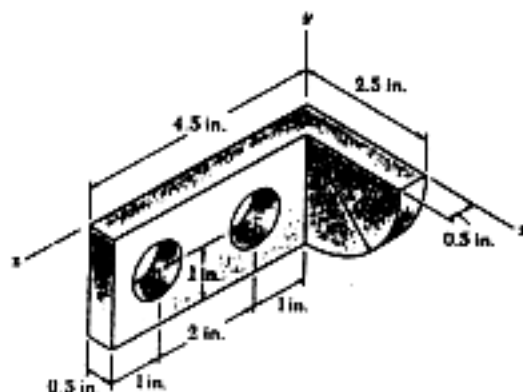


圖 3

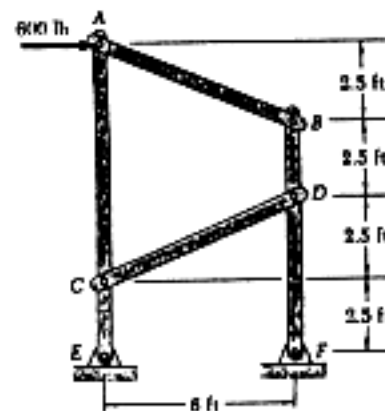四、　如圖4所示，一個600磅（lb）的水平力施於骨架之 A 點，
　　試決定作用於骨架兩垂直元件 E 和 F 之力？（12分）



圖 4

6×400/B

## 貳. 材料力學

Mechanics of Materials

1.  Two wood beams cut from the same timber are arranged as shown in Fig. 1, the free end of the cantilever DC being supported at the middle of the simple beam AB.   Both beams are horizontal and at right angles to one another.   Find the vertical deflection $\delta_c$ at the point of contact due to a vertical load P applied to the end of the cantilever as shown. (15%)

2.  A simply supported beam as shown in Fig. 2 is struck at its midpoint C by a ball of weight W freely falling from a height h above the beam.   Neglecting the weight of the beam and assuming that it behaves elastically, find the total deflection $\delta$ that will be produced at point C. (15%)

3.  Determine the deflection $\delta$ and the slope $\theta$ at the free end A of the cantilever beam AB loaded as shown in Fig. 3.   Please draw the bending moment diagram for this case. (10%)

4.  A prismatic cantilever beam AB carries a uniformly distributed load over the portion b of its length as shown in Fig. 4.   Find the deflection $\delta$ of the free end A.   Please also draw the bending moment diagram for this case. (10%)
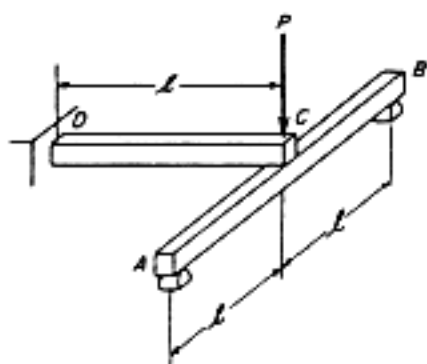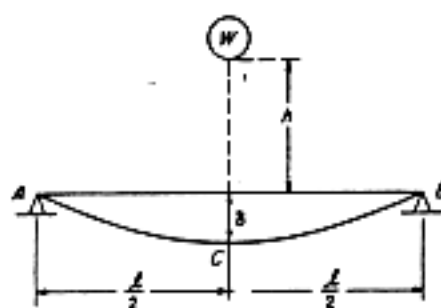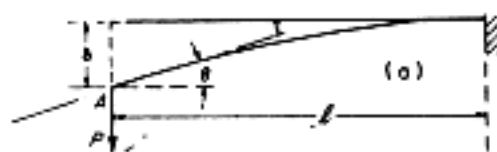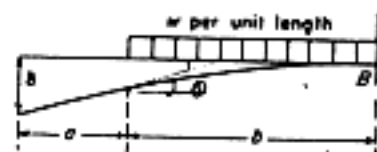


Fig. 1



Fig. 2.



Fig. 3.



Fig. 4.