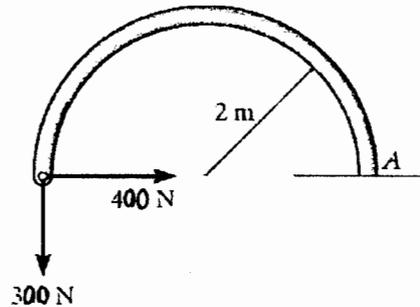


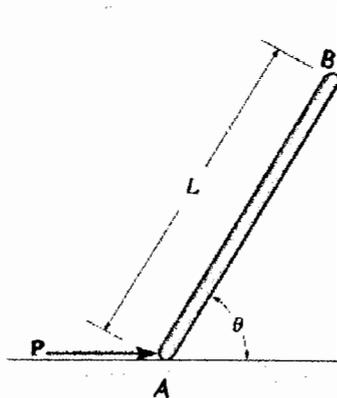
※ 考生請注意：本試題不可使用計算機

1. (20%)

- (a) Determine the reactions at the fixed support A , as shown below.
 (b) Find the *maximum* bending moment in the curved beam.



2. (20%) A uniform thin rod of weight W rests against the smooth wall and floor as shown below. Determine the force P needed to hold it in equilibrium by using
 (a) free-body analysis, and
 (b) the method of virtual work.



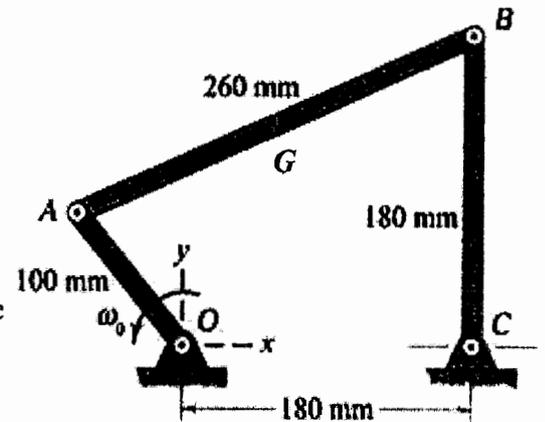
(背面仍有題目,請繼續作答)

※ 考生請注意：本試題不可使用計算機

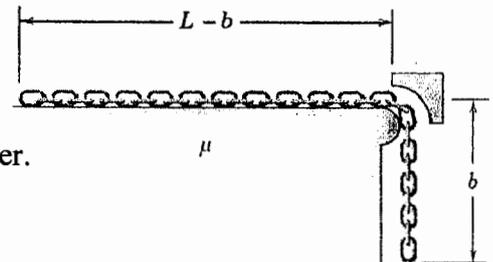
3. (20%) In the four-bar linkage shown, control link OA has a counter-clockwise constant angular velocity $\omega_0 = 10 \text{ rad/s}$. When link CB passes the vertical position shown, point A has coordinates $x = 60 \text{ mm}$ and $y = 80 \text{ mm}$.

At this instant, calculate

- (1) the angular velocity of link AB and BC ,
- (2) the angular acceleration of AB and BC , and
- (3) the velocity and acceleration of point G at the mid-point of AB .



4. (20%) The chain is released from rest with the length b of overhanging links just sufficient to initiate motion. The coefficients of static and kinetic friction between the links and the horizontal surface have essentially the same value μ . Neglect any friction at the corner.



- (1) Determine the velocity of the chain when the last link leaves the edge.
- (2) How much time does it take for the last link to leave the edge?

5. (20%) A uniform rod of weight W and length L is initially supported by a pin connection at point A and a wire at point B in gravitational field.

- (1) What is the force on pin A at the instant when the wire is cut to release the rod rotating about the pin?
- (2) What is the force at A when the rod has rotated 45° from its initial position?
- (3) How much time does it take to reach 90° since its release?

