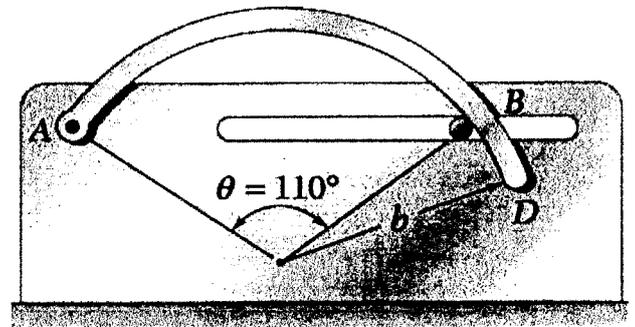


※ 考生請注意：本試題可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

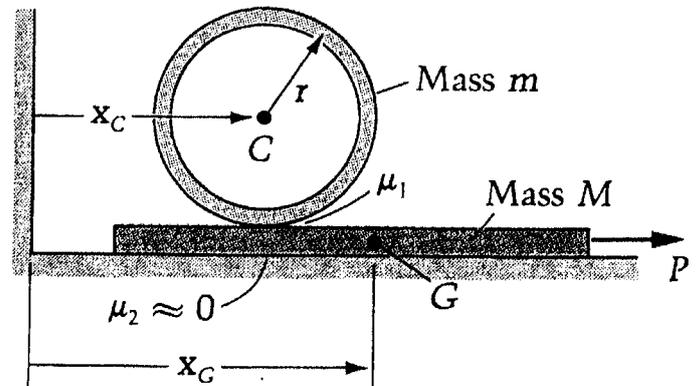
1. (25%) 請將以下中文翻譯成英文。

- (1) 若一對齒輪以等速比轉動，則相嚙合兩齒在接觸點的公法線，必恆與齒輪連心線交於一固定點。
- (2) 當轉動物體的旋轉軸通過質心且對該軸的慣性積為零時，稱為動平衡，此時軸承僅受重力。

2. (25%) Rod AD is bent in the shape of an arc of a circle of radius $b = 150$ mm. The position of the rod is controlled by pin B which slides in a horizontal slot and also slides along the rod. Knowing that at the instant shown pin B moves to the right at a constant speed of 75 mm/s, determine (a) the angular velocity of the rod, (b) the angular acceleration of the rod.



3. (25%) Force P is applied to a plate that rests on a smooth surface. Find the largest force P for which the pipe will not slip on the plate ($I_C \approx mr^2$).



4. (25%) The 2.5 -kg slender rod AB is released from rest in the position shown and swings to a vertical position where it strikes the 1.5 -kg slender rod CD . Knowing that the coefficient of restitution between the knob K attached to rod AB and rod CD is 0.8 , determine (a) the angular velocity of rod AB just before the strike, (b) the angular velocity of rod CD immediately after the strike, and (c) the maximum angle θ_m through which rod CD will rotate after the impact. ($g = 9.81$ m/s²)

