1. (25%) A ring of mass m and radius r is released from rest on a slope with an inclined angle θ from the horizontal surface. If the coefficients of static and kinetic friction are μ_s and μ_k respectively, determine the angular acceleration α of the ring. (Hint: consider the cases: rolling without slipping and with slipping, respectively)
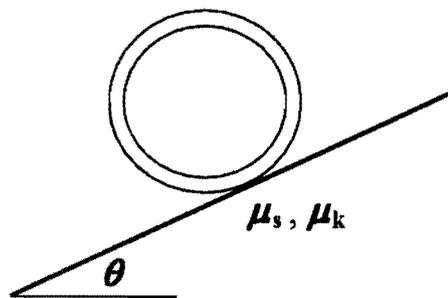

2. (25%) The slender rod as shown has a mass m and length L and is released from rest when $\theta = 0$. Determine the horizontal and vertical components of the reaction forces at the pin at the instant $\theta = 90°$. The moment of inertia of the rod about point A is $I_A = \frac{1}{3}mL^2$.
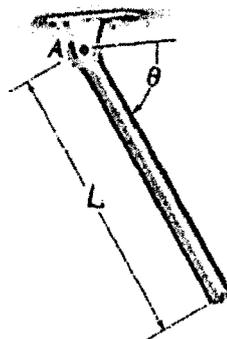
(背面仍有題目,請繼續作答)

3.(25%) A cable of negligible mass is suspended from the fixed points shown and has a zero slope at its lower end. If the cable supports a unit load w which decreases uniformly with x from w_0 to zero as indicated, determine the equation of the curve assumed by the cable.
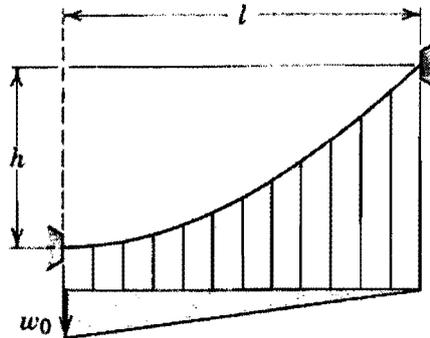
4.(25%)A uniform steel ring 600 mm in diameter has a mass of 50 kg and is lifted by the three cables, each 500 mm long, attached at points A, B and C as shown. Compute the tension in each cable.