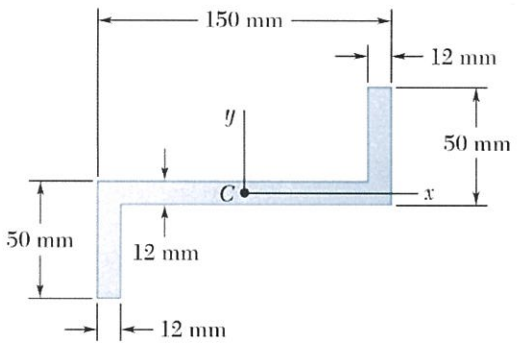
題號： 222　　國立臺灣大學 109 學年度碩士班招生考試試題

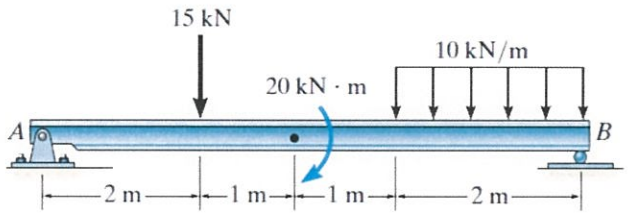
科目： 應用力學(A)

節次： 7

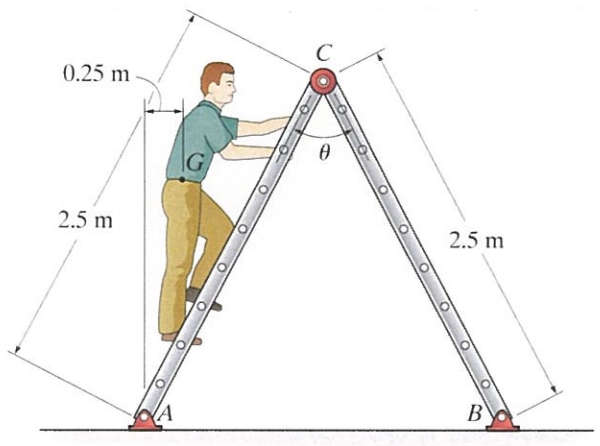
1. Determine the orientation of the principal axes, which have their origin at centroid *C* of the beam's cross-sectional area. Also fine the principal moments of inertia. (30%)



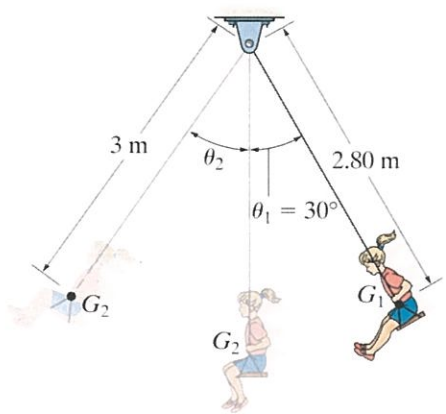
2. Draw the shear and moment diagrams for the beam shown below. Indicate the magnitudes of shear and moment at the location where the concentrate load and couple moment applying. (20%)



3. Determine the maximum angle θ so that the ladder does not slip when it supports the 90-kg man in the position shown. The surface is rather slippery, where the coefficient of static friction at A and B is $\mu_s = 0.33$. (25%)



4. A child having a mass of 40 kg holds her legs up as shown as she swings downward from rest at $\theta_1 = 30^\circ$. Her center of mass is located at point G_1. When she is at the bottom position $\theta = 0^\circ$, she suddenly lets her legs come down, shifting her center of mass to position G_2. Determine her speed in the upswing due to this sudden movement and the angle θ_2 to which she swings before momentarily coming to rest. Treat the child's body as a particle. (25%)



試題隨卷繳回