

Department of Mechanical Engineering
University of California at Berkeley
ME 104 Engineering Mechanics II
Spring Semester 2007

Instructor: F. Ma

Midterm Examination No. 2

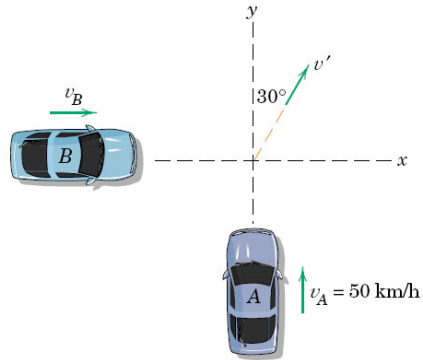
April 6, 2007

The examination has a duration of 50 minutes.

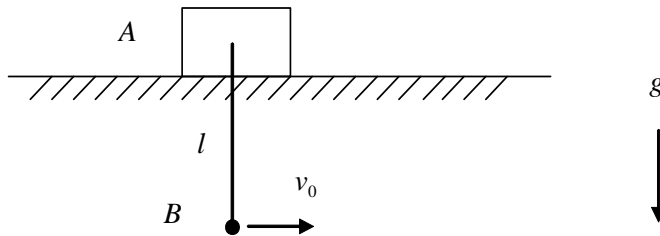
Answer ALL questions.

All questions carry the same weight.

- Two cars collide at right angles in the intersection of two icy roads. Car A has a mass of 1200 kg and car B has a mass of 1600 kg. The cars become entangled and move off together with a common velocity v' in the direction indicated. If car A was traveling 50 km/h at the instant of impact, compute the corresponding velocity of car B just before impact.



- Ball B , of mass m_B , is suspended from a cord of length l attached to cart A , of mass m_A , which can roll freely on a frictionless horizontal track. If the ball is given an initial horizontal velocity v_0 while the cart is at rest, determine (a) the velocity of B as it reaches its maximum elevation, (b) the maximum vertical distance h through which B will rise. It is assumed that $v_0^2 < 2gl$.



- The smaller cylinder rolls on the stationary larger cylinder without slipping. The speed of the center of the rolling cylinder is constant. Determine the acceleration of the point of contact A and the point B for the position shown.

