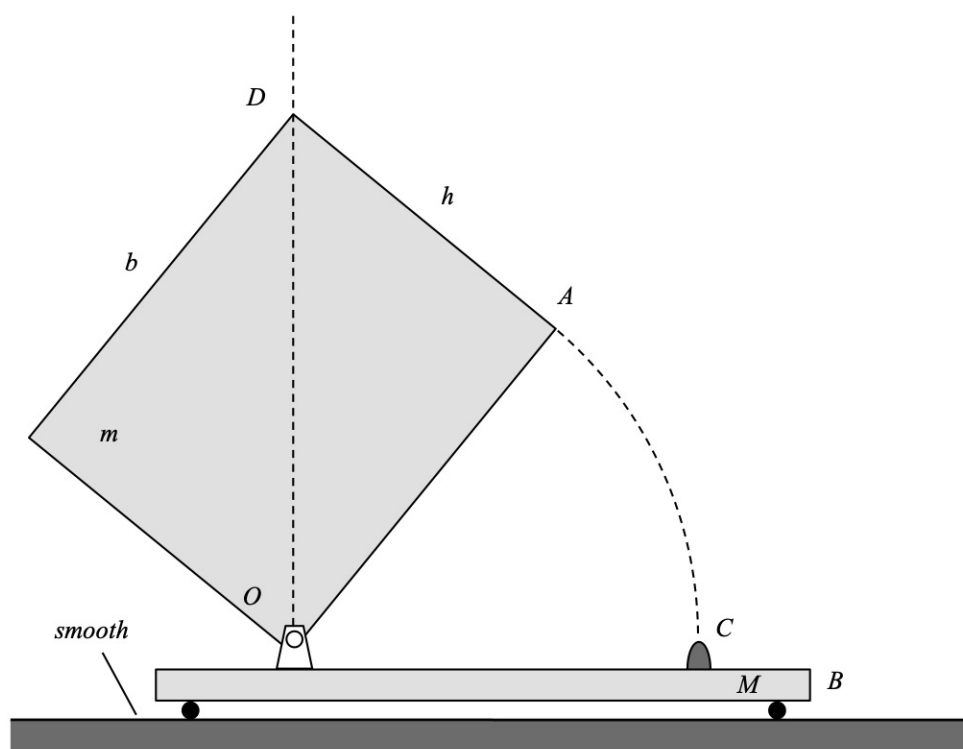


Homework H.5.N

Given: A homogeneous rectangular plate of mass m is pinned to cart B at corner O, where cart B is constrained to move along a smooth horizontal surface. The system is released from rest with corner D displaced slightly to the right of a vertical line passing through the pin at O. As a result, the plate eventually impacts bumper C on the cart, with the coefficient of restitution between the plate and the bumper being e .

Find: For this problem:

- Determine the velocity of the center of mass of the plate immediately before the plate contacts the bumper C. Write your answer as a vector.
- Determine the velocity of the center of mass of the plate immediately after the plate contacts the bumper C. Write your answer as a vector.



Use the following parameters in your analysis: $m = 10$ kg, $M = 25$ kg, $b = 2$ m, $h = 1$ m and $e = 0$.