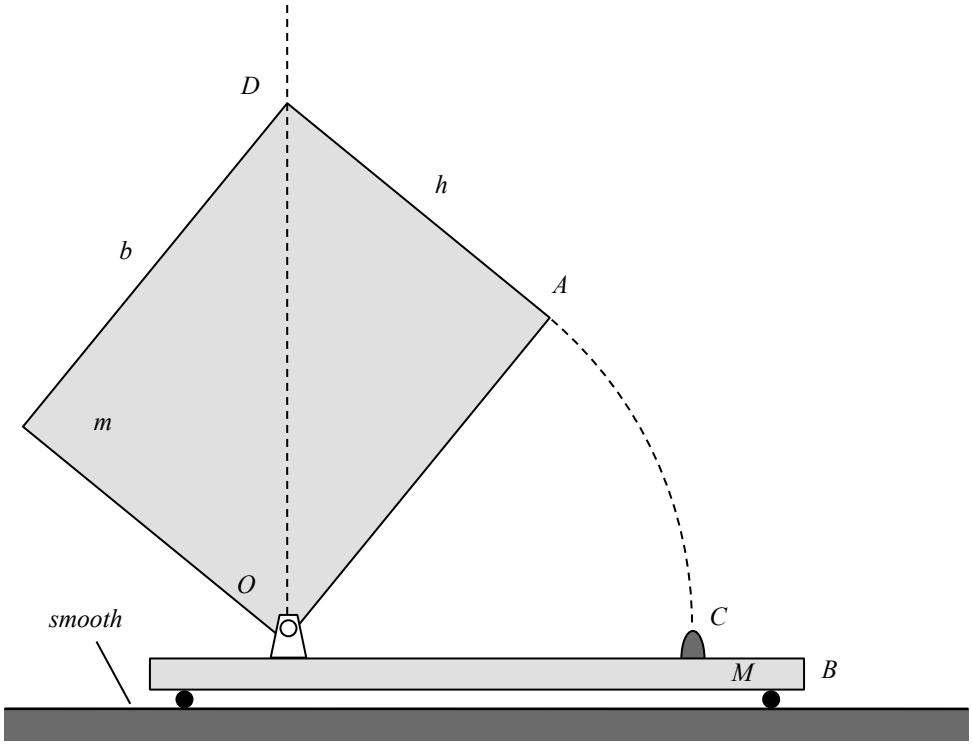
**Homework H.5.N**

**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:
(a) 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.
(b) 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 $e = 0$.