



The moment of inertia of a rod about its center of mass (point  $O$ , the mid-point in the sketch) is given by  $I_{cm} = \frac{m L^2}{12}$ . Here  $L$  is length of the rod.

Based on the law of parallel axis  $I' = I_{cm} + M D^2$ , determine the moment of inertia defined by a rotating axis parallel to  $O'O''$ , and this axis passes through  $A$ , one of the end points of the rod.

- A)  $I' = \frac{m L^2}{3}$ .
- B)  $I' = \frac{m L^2}{6}$ .
- C)  $I' = \frac{m L^2}{12}$ .

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$$I' = m \left( \frac{L}{2} \right)^2 + I_{cm} = \frac{m L^2}{4} + \frac{m L^2}{12} = \frac{m L^2}{3}.$$

Answer **A**.