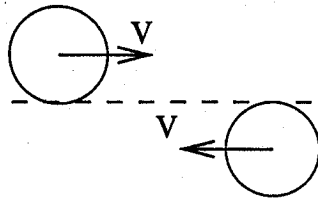


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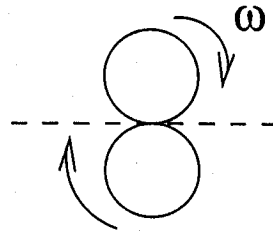
**Problem 1 (5 points)**

Two cylindrical pucks, each of mass  $M$  and radius  $R$ , slide towards each other on a smooth frictionless surface. Initially, each has speed  $v$ . They undergo a grazing collision, and stick together at their edge.

Before



After



- (a) (1 point) What is the combined angular momentum of the two pucks about their mutual center of mass before the collision?
- (b) (1 point) What is the combined moment of inertia of the two pucks about their mutual center of mass after the collision?
- (c) (2 points) What is  $\omega$ , the angular speed of the two pucks about their mutual center of mass after the collision?
- (d) (1 point) What fraction of the original energy is lost to heat during the collision?