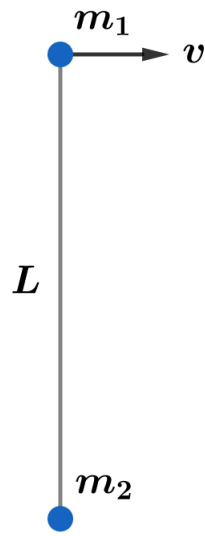


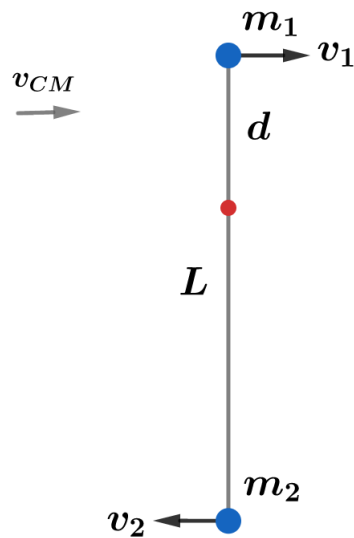
2018B F=ma Exam: Problem 23

Kevin S. Huang



We can go into the center of mass (CM) frame where both masses undergo circular motion about their CM. Since

$$v_{CM} = \frac{m_1 v}{m_1 + m_2}$$



we have in the CM frame

$$v_1 = \frac{m_2 v}{m_1 + m_2}$$

The distance from m_1 to the CM is

$$d = \frac{m_2 L}{m_1 + m_2}$$

After one revolution, the masses have their initial velocities so m_2 will be at rest again in the ground frame. The period is

$$T = \frac{2\pi d}{v_1} = \frac{2\pi L}{v}$$

so the answer is \boxed{A} .