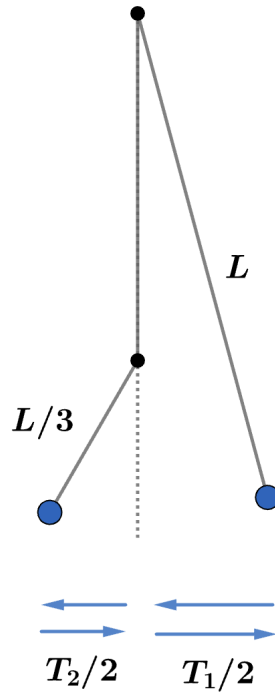# 2009 F=ma Exam: Problem 18

Kevin S. Huang

Recall the period of a simple pendulum is given by

$$T = 2\pi\sqrt{\frac{l}{g}}$$

In our system, the pendulum oscillates as a simple pendulum of length L half the time and as a simple pendulum of length $L/3$ half the time. Thus, the period is

$$T = \frac{T_1}{2} + \frac{T_2}{2} = \pi\sqrt{\frac{L}{g}} + \pi\sqrt{\frac{L}{3g}} = \pi\sqrt{\frac{L}{g}}\left(1 + \frac{1}{\sqrt{3}}\right)$$

so the answer is $\boxed{\text{E}}$.