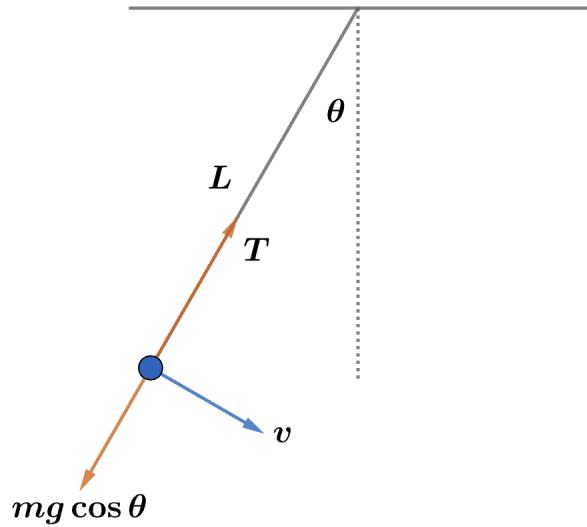


2013 F=ma Exam: Problem 19

Kevin S. Huang



Since the pendulum is undergoing circular motion, we have

$$T - mg \cos \theta = \frac{mv^2}{L}$$

so the tension is

$$T = mg \cos \theta + \frac{mv^2}{L}$$

At the bottom $\theta = 0$, $\cos \theta$ is maximized since $\cos 0 = 1$ while v is also maximized by conservation of energy (pendulum is at lowest point of swing). Thus, both terms are maximized so the tension is largest at $\theta = 0$. Hence, the answer is B.