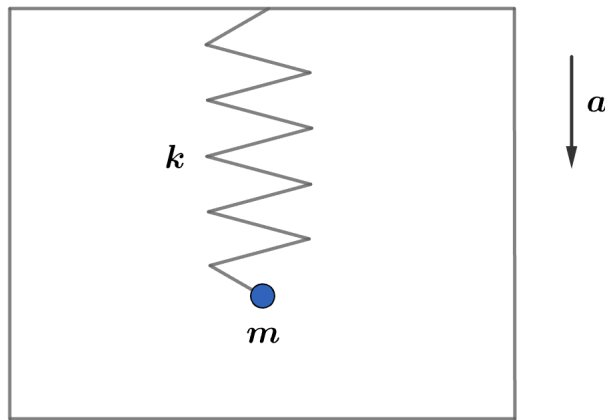# 2012 F=ma Exam: Problem 18

Kevin S. Huang

Note that dropping the box changes the effective gravity experienced by the mass (in the box frame).

- A) Since the effective gravity g changes, the equilibrium position and hence amplitude would change.

- B) The period is given by

$$T = 2\pi\sqrt{\frac{m}{k}}$$

  and is not affected by g.

- C) Since the amplitude changes, the maximum speed would change.

- D) Since the equilibrium position changes, the height where the mass reaches maximum speed would change.

- E) Since the amplitude changes, the maximum height reached by the mass would change.

Thus, the answer is $\boxed{\text{B}}$.