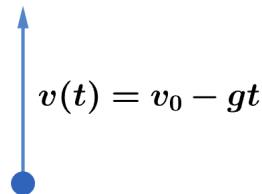


2024 F=ma Exam: Problem 4

Kevin S. Huang



From the initial launch to the first bounce, we have

$$v(t) = v_0 - gt$$

so the kinetic energy is

$$K(t) = \frac{1}{2}mv(t)^2 = \frac{1}{2}m(gt - v_0)^2$$

which is an upward-opening parabola. Since collisions are elastic, $K(t)$ is periodic after every bounce so the answer is D.