

## Overview

The following are key observations and recurring themes from Section 1 of Practice Exam 1. These patterns are likely to appear on the real AP<sup>®</sup> Physics 1 exam as well.

## General Strategies

- **Extra information is a trap:** Some problems contain more information than you need. If something in the problem seems irrelevant, it probably is. Do not let extra information distract you. (Q2)
- **Split multi-part problems:** Some problems describe a scenario with two distinct phases, such as an applied force followed by free fall. Identify the two parts and solve each separately. (Q6)
- **Read carefully and learn the physics:** Do not try to outguess the exam writers by looking for patterns in answer choices. Learn the physics and read the question carefully. (Q16, Q17)
- **Pay attention to the system:** Answer choices may refer to different systems (e.g., block only vs. block-spring vs. block-spring-Earth). Read each answer choice carefully to know exactly what system is being described. (Q30)
- **Tech issues during the exam:** Graphics may take a moment to load, and you may occasionally see the image from the previous question while reading the next one. Be aware this may happen and ask your proctor for help if needed.

## Graphs

- **Area under a force vs. position graph:** The area under a net force vs. position curve equals net work. By the work-energy theorem, net work equals change in kinetic energy. This is a likely question type on the real exam. (Q5)
- **Graphs with a legend:** A graph may show data for two different objects distinguished by a legend. Read the legend carefully before interpreting the graph. (Q9)
- **Center of mass shown at equal time intervals:** A figure may show the position of an object's center of mass at equal time intervals. This is a classic physics representation you may see on the exam. (Q10, Q11, Q12)

## Physics Content Reminders

- **Know your equations precisely:** A memorized equation can be a trap if you misapply it. For example, Torricelli's theorem gives the speed of fluid exiting a small hole, not the volumetric flow rate. Also, the variable  $H$  in the problem may refer to a different height than in the equation. Read carefully. (Q17)
- **$r$  in gravitation is center of mass-to-center of mass distance:** In Newton's Universal Law of Gravitation and the Universal Gravitational Potential Energy equation,  $r$  is the distance between the centers of mass of the two objects, not the height above the surface. (Q20)
- **Signs matter in angular momentum:** When angular momentum changes direction, the sign of the angular momentum changes. Forgetting to make a final angular momentum negative is a classic mistake that gives a wrong answer. (Q34)
- **Choose the axis of rotation strategically:** For an object in static equilibrium, the net torque about any axis equals zero. Choose an axis that passes through the point of application of an unknown force to eliminate that force from the torque equation. (Q31)
- **Parallel axis theorem:** You are very likely to see a problem that requires finding the rotational inertia of an object about an axis that does not pass through its center of mass. Use the parallel axis theorem. (Q37)
- **Know the three collision types:** You may be asked to identify whether a collision is elastic, perfectly inelastic, or inelastic, based on their definitions. Know all three. (Q36)