

Overview

The following are key observations and general strategies from Section 2 of Practice Exam 2. These patterns and reminders apply to the real AP[®] Physics 1 exam as well.

General FRQ Strategies

- **Stick to the physics in the problem:** Do not get distracted by real-world complications not addressed in the problem. If the problem statement or illustration shows an idealized scenario, accept it and solve accordingly. The AP[®] Physics 1 exam takes place in an ideal world unless otherwise stated. (Q1, Q2)
- **“Not drawn to scale” means what it says:** When a problem states that intervals or figures are not drawn to scale, you cannot infer any relative distances or sizes from the drawing. Only use values given explicitly in the problem. (Q1a)
- **“In terms of” does not mean all variables must appear:** When a problem asks for an answer in terms of a list of variables, not all of those variables need to appear in your final answer. If one cancels out, that is fine and may itself be a useful observation. (Q1c)
- **Follow the instructions:** If a question tells you to use a specific physics concept, you must use it to receive credit. If a question tells you not to use something, using it will earn no credit. Also know the names of key equations (e.g., the work-energy theorem) since they will not be labeled on the reference sheet. (Q1d)
- **Familiar concepts in unfamiliar setups:** A common FRQ pattern is to start with a familiar scenario (e.g., a mass-spring system in SHM) and then add a complication (e.g., a second block is added). Apply what you know to the new situation. (Q2)

Drawing Graphs

- Use a straightedge for all straight lines. This also makes curves more visually distinct from straight-line segments. (Q1a)
- Use the graphing calculator in Bluebook to check the shape of an unfamiliar curve. For example, if velocity is proportional to the square root of distance, type $y = x^{0.5}$ (using the caret symbol, Shift+6) to see the shape before drawing it. (Q1a)
- When drawing a graph as an answer, determine both the shape of the curve and where on the graph it should be drawn. For example, if the period changes, the curve must reflect the correct new period, not just fill the available space. (Q2d)
- When labeling a graph axis, always include units. The question will often remind you, but do not skip it. Also scale the axis so your data points cover at least half the available range; do not bunch all data in one corner. (Q3c)

Experimental Design and Linearizing Data

- Answer part b (how the data will be graphed and analyzed) before part a (the procedure). It is easier to write the procedure once you know what the experiment is trying to achieve. (Q3)
- Sometimes you must calculate data for both the x- and y-axes, not just one. Read the question carefully to determine what needs to be computed before plotting. (Q3c)
- Rearranging equations to match slope-intercept form ($y = mx + b$) is a recurring requirement on the AP[®] exam, especially in EDA questions. Identify the y-variable, slope (constants), x-variable, and y-intercept explicitly. (Q3c, Q3d)

Physics Content Reminders

- **Do not simplify an expression unnecessarily:** You do not need to combine expressions under a single radical to receive full credit. Leave your answer in a mathematically correct form and move on. Do not waste time on cosmetic algebra. (Q1c)
- **Energy bar graphs:** Energy bar graphs appear frequently in TBR free-response questions. Be prepared to draw and interpret them on the real exam. (Q2a)
- **Static friction is not always at its maximum:** The force of static friction is less than or equal to the coefficient of static friction times the normal force. The equation $F_{sf} = \mu_s F_N$ gives only the maximum value of static friction. Do not assume static friction always equals that maximum. (Q4)
- **Draw free-body diagrams even when not explicitly asked:** Some problems require summing forces for multiple objects but do not specifically instruct you to draw free-body diagrams. Draw them anyway as part of your solution process. (Q4)