Overview

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

Free-Body Diagrams

- You are guaranteed to draw at least one free-body diagram on the AP® exam. Never include components of force vectors in a free-body diagram. The force of gravity always points straight down; never break it into components in the diagram.
- Draw force vector arrows proportional in length to one another. If you are not confident in your drawing, add a written note clarifying the relative lengths (e.g., “The arrows for the normal force and gravity have the same length”). You still must draw the diagram, but words can support it.
- For objects moving in a circle, sum forces in the in-direction. Forces directed inward are positive; forces directed outward are negative. Both forces can point downward and still both be inward (e.g., tension and gravity at the top of a vertical circle). If the relative magnitudes of the forces cannot be determined from the given information, the relative lengths of the arrows in the free-body diagram also cannot be determined.

Directions and Signs

- Be careful and consistent with positive and negative directions. When a problem does not define a positive direction, you may choose, but you must stay consistent throughout all parts of the question. An inconsistent sign can lead to taking the square root of a negative number or other nonsensical results.
- A reliable default convention: up, right, North, East, and in are positive; down, left, South, West, and out are negative.

Linearizing Data and Graphs

- Relating a physics equation to slope-intercept form ($y = mx + b$) will likely come up several times on the exam. Rearrange the equation so one variable is on the left (the y-axis variable), a set of constants forms the slope, a second variable is the x-axis quantity, and any remaining constant term is the y-intercept. The y-intercept is often not zero.
- Experimental Design and Analysis questions often require you to calculate an additional column of data from the given data before plotting. This is expected and normal. (Q3c)
- When calculating the slope from your best-fit line, pick two points that lie on the best-fit line, not data points. Circle those two points on your graph so the human grader can clearly see what you used.

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Read the Full Question Before Answering

- For the Experimental Design and Analysis question, it is often easier to answer the graphing part (part b) before writing the procedure (part a). Reading the full question first reveals this. Keep your experiment as simple as possible. (Q3a, Q3b)
- For the Qualitative/Quantitative Translation question, it is often easier to derive the equation first (part b) and then use it to evaluate the qualitative claim (part a). Again, reading the full question first makes this clear. (Q4a, Q4b)

Qualitative/Quantitative Translation Structure Reminder

The standard QQT structure is: make a qualitative claim, derive an equation, then justify whether the derived equation supports or does not support the original claim. Expect this structure on the real AP® exam. (Q4)

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