



AP[®] Physics C Mechanics 2004 Scoring Commentary

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**AP[®] PHYSICS C MECHANICS
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Question 1

Sample: A

Score: 14

The only error in this paper is not adding the length L in part (e).

Sample: B

Score: 10

Part (b) only earns the point for having two applied forces. The student makes an error in part (d) when simplifying the kinetic energy after the collision, but gets the point for then constructing the ratio. Note that in part (e), the student substitutes $g = 10 \text{ m/s}^2$ when determining the time of fall. This student also forgets to add the length L in part (e).

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Question 2

Sample: A
Score: 14

This paper lost only one point because the student did not indicate what data was used to obtain the slope of the graph in part (b) iii.

Sample: B
Score: 12

This student also did not show how to get the slope in part (b) iii. Part (c) gets credit only for the torque equation, since the words written by the student indicate that the torque is taken to be equal to mgR , and the relationship between angular and linear accelerations. The other parts received full credit.

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Question 3

Sample: A

Score: 15

Part (a) is an example of splitting the rod into two parts to complete the calculation of the moment of inertia. In part (b), the student uses the bottom of the hanging rod as the reference point for all heights.

Sample: B

Score: 12

One point is lost in part (b), since the signs of the two potential energy terms are reversed from the correct signs. The student happens to then make an algebra error and actually get the correct answer. In part (c), the wrong distance is used, and thus the final answer is incorrect.