

Physics Challenges for Teachers and Students

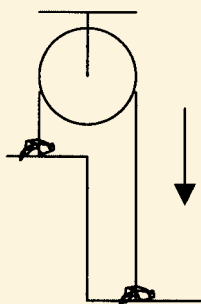
This month we present three new physics problems to challenge teachers and their students. Readers are encouraged to submit solutions to the address given below, with the “best” answers for each problem appearing in a later issue. We also welcome readers to send in their own favorite physics challenges as well as suggestions for upcoming issues.

Please send correspondence to:

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► The Chain Reaction

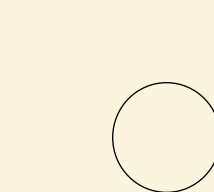
A long uniform chain is hung over a frictionless pulley as shown. The left part of the chain rests on a table, and the right part rests on the floor. Soon after the chain is released, it reaches a constant velocity. Find that velocity (v), given that the table is one meter high ($h = 1.0$ m).



► The Spin Doctor

A thin-walled cylinder of radius R is rotating *clockwise* about its axis. The cylinder is

placed in the corner as shown. The coefficient of kinetic friction between the wall and the cylinder is the same as that between the floor and the cylinder (μ). Find the angular deceleration of the cylinder (α).



► The Leap of Faith

A frog sits on the end of a long board of length L . The board rests on a frictionless horizontal table. The frog wants to jump to the opposite end of the board. What is the minimum take-off speed v that allows the frog to do the trick? The board and the frog have equal masses.