ADVANCED PHYSICS CLUB

OCTOBER 19, 2025

Useful resources

The updates, homework assignments, and useful links for APC can be found on SchoolNova's web page:
`https://schoolnova.org/classinfo?class_id=2252&sem_id=74`
The practical information about the club and contacts can be found on the same web page.

Today's meeting

Today we finished solving problems on kinematics of acceleration and started a new topic: projectile motion. One remaining problem is reassigned, new problems are on projectile motion as well.

Reassigned Homework

1. A ball is launched on a smooth plane inclined at 45° to the ground. Initial velocity of the ball is v, it makes a 45° angle with the horizontal edge of the plane. What distance along the horizontal will the ball travel before hitting the ground?

New Homework

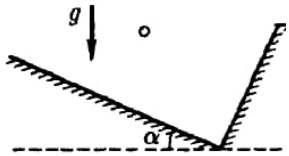
1. Problem 5 from the 2017 F=ma exam that can be found at the following link:
`https://www.aapt.org/physicsteam/2018/upload/2017-Fma-exam.pdf`

2. A rock is thrown horizontally from a hill with a constant slope α. The rock landed at a distance L downhill. Find the speed it was thrown with.

3. Water is going out of a hose with velocity v at an angle θ to the horizon. The hose has cross-section A and is located at level ground. How much water by volume is in the air at any given moment?

4. A ball is initially held at height H above an infinitely long inclined plane with the inclination angle α to the horizon. The ball is released with no initial velocity. Find the distances between the points of impact between the ball and the inclined plane in the subsequent motion. Assume that all collisions are perfectly elastic.

5. A ball is bouncing back and forth between two walls of a rectangular box along the same trajectory. One of the walls makes angle α to the ground. The time interval between two consecutive bounces is Δt. Find speed of the ball right after the collision for both of the collision points.



***6.** What minimal velocity should a ball have in order to go over a rectangular house of height H and width L, if it's thrown by a teenager of height h who can choose an arbitrary position on the ground to make the throw?

For the next meeting

IMPORTANT: The next club's meeting is at 2:40pm, in-person, on Sunday, **October 26**.