

USEFUL RESOURCES

The updates, homework assignments, and useful links for APC can be found on SchoolNova's web page:
http://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2022

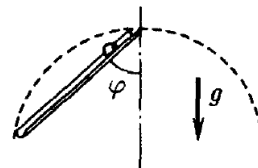
The practical information about the club and contacts can be found on the same web page.

TODAY'S MEETING

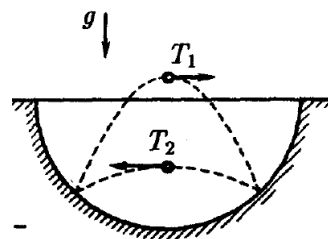
Today we solved some problems on projectile motion. There were few problems which we did not have time to discuss, so this assignment will be on the same topic with some more problems added.

HOMEWORK

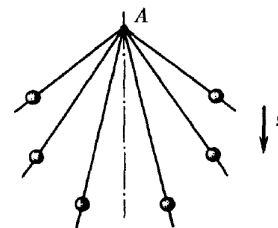
1. A ball is released from rest and hits an inclined plane after falling a distance H . Find the distances between points at which the ball hits the inclined plane after the initial collision. Assume that all collisions are perfectly elastic. The plane is inclined at an angle α .
2. A ball initially is at the top point of a circle of radius R . The ball starts moving in a smooth gutter at angle ϕ to the vertical. After what time will it reach the circle again? Free fall acceleration is g .



3. A hose is lying on the ground. Water flies out of this hose at an angle 45° to the horizon with speed 10 m/s. Cross section area of the hose is 5 cm^2 . Find the total mass of water which is in the air at any given moment of time.
- *4. What minimal velocity should a ball have in order to go over a rectangular house of height H and length L , if it's thrown by a teenager of height h who can choose an arbitrary position on the ground to make the throw?
- *5. A ball periodically goes back and forth between two points in a spherical hole. These points are at the same height, collisions of the ball with walls of the hole are elastic. Time interval between collisions when the ball moves right is T_1 and when it moves left time interval is $T_2 \neq T_1$. Find the radius of the hole.



- *6. Several beads initially at rest are released simultaneously and start sliding along several smooth spokes (see figure). On what curve would the beads lie after time t ? Free fall acceleration is g .
A big hint: Look at the problem number two.



FOR THE NEXT MEETING

IMPORTANT: The next club's meeting is at 3:30pm, via Zoom, on Sunday, **November 7**.