

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](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

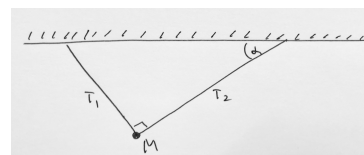
Today we continued solving problems on Newton's laws. Two problems are reassigned, there also are a few new problems on strings, springs and friction.

REASSIGNED HOMEWORK

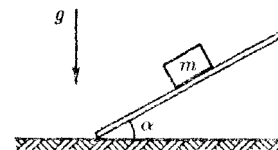
1. A chain of mass  $m$  is hung by its ends in such a way that it makes angle  $\alpha$  with the horizon near the ends. Find the tension in the chain at the lowest point and near the ends.
2. Heavy rod is bent at the right angle in its' middle point. Then it is hung from one of its' ends. What is the angle between the vertical direction and the upper half of the rod?

NEW HOMEWORK

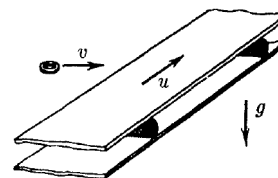
1. A weight of the mass  $M$  is suspended on two strings as shown in the picture (the angle at the vertex  $M$  is the right one). Find the ratio of tensions in strings  $T_1/T_2$ .



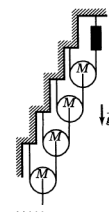
2. A body of mass  $m$  on a horizontal plane is acted upon with a force  $F$  directed at an angle  $\alpha$  above the horizon. Friction coefficient is  $\mu$ . Find acceleration of the body if it is not lifted above the plane.
3. A body of mass  $m$  lies freely on a horizontal plane with friction coefficient  $\mu$ . The plane is slowly inclined all the way up to  $90^\circ$ . Find how the friction force between the body and the plane depends on the angle  $\alpha$  which the plane makes with the horizon.



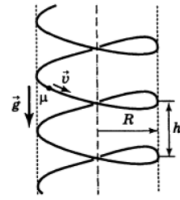
4. A horizontal conveyor belt is moving with speed  $u$ . A puck flies on the belt with initial velocity  $v$  perpendicular to the belt. Find the maximal width of the belt at which the puck will still reach the opposite side of the belt if friction coefficient between the puck and the belt is  $\mu$ .



- \*5. A half-infinite system is made out of massless ropes and similar pulleys each of mass  $M$ . Find what force is displayed by a spring scale  $S$ .



- \*6. A long wire is shaped as a coil of radius  $R$  and pitch  $h$ . The axis of the coil is vertical. There is a bead sliding down along the coil. Friction coefficient between the bead and the coil is  $\mu$ . Find the steady speed of the bead.



FOR THE NEXT MEETING

**IMPORTANT:** The next club's meeting is at 3:30pm, via Zoom, on Sunday, **December 11**.