

USEFUL RESOURCES

The updates, homework assignments, and useful links for APC can be found on SchoolNova's web page:

[https://schoolnova.org/nova/classinfo?class\\_id=adv\\_phy\\_club&sem\\_id=ay2023](https://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2023)

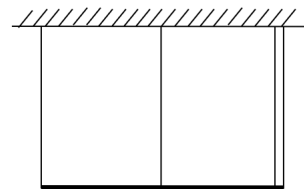
The practical information about the club and contacts can be found on the same web page.

TODAY'S MEETING

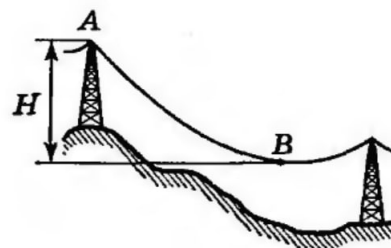
Today we discussed some of the problems of the previous assignment. Two problems are reassigned.

REASSIGNED HOMEWORK

- 4 A uniform beam is attached to the ceiling with a few similar ropes of the same length. One rope is attached to an end of the beam and two ropes are attached to the other end. One more rope is attached to the center of the beam. What are the ratios of tension forces in all of the ropes?



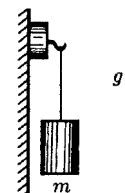
- 5 A power line in the mountains has two supports at different heights. The total mass of the wire between the supports is  $m$  and its total length is  $L$ . Vertical distance between the lowest point of the wire  $B$  and the attachment point to the higher support  $A$  is  $H$ . The length of segment  $AB$  of the wire is  $l$ . Find the maximal tension force in the wire.



HOMEWORK

We continue with Newton's laws. This assignment is on friction force.

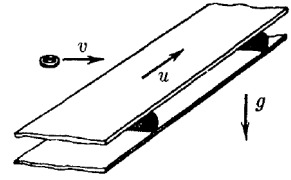
- On an icy road friction coefficient between the tires of a car and the road is 9 times less than on a dry road. For what speed on an icy road the braking distance is the same as for 30 miles per hour on a dry road?
- A light magnet with a hook on a vertical steel wall stays at rest when a mass hanged on the hook is less than  $m_0$ . Friction coefficient between the wall and the magnet is  $\mu$ . What is the magnetic force? What will acceleration of the magnet be if a mass  $m > m_0$  is hung from the hook?



- A system of blocks lies on a horizontal frictionless table, as shown on the figure. The bottom right block is being pulled to the right with force  $F$ . Friction coefficient between blocks  $m_1$  and  $m_2$  is  $\mu$ . Find the acceleration of every block in the system.



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



- \*5. A coin lies on a very long inclined plane with angle  $\alpha$ . Friction coefficient is  $\mu = \tan \alpha$ . The coin is hit and starts to move with horizontal velocity  $v$  along the plane. Find velocity of the coin after a very long time.

FOR THE NEXT MEETING

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