

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=ay2024

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

TODAY'S MEETING

Today we solved a few problems on circular motion. One problem is partially reassigned, our next topic is Newton's laws.

Please solve the problems at home! It is most effective when during the club meeting we discuss the solutions that you already have.

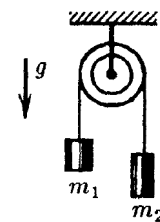
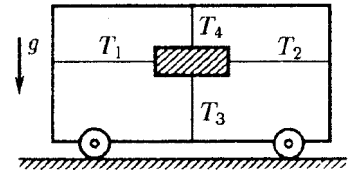
If you feel like you need clarification about the formulation of any problem, you are always welcome to email apc@schoolnova.org

REASSIGNED HOMEWORK

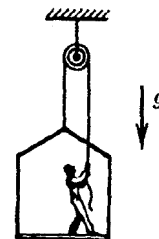
- *1. A rock thrown with initial velocity v_0 at angle α to the ground goes along a parabola. A bird flies along the same parabola with constant speed v_0 . Find the acceleration of the bird at the highest point of the trajectory.

NEW HOMEWORK

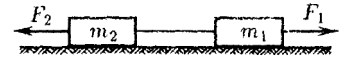
1. A hockey puck is hit with a stick and slides on the ice for 5 seconds traveling 20 meters before stopping. Mass of the puck is 100 grams. Find the force of friction acting on the puck while it was sliding (assuming it was constant).
2. A block is attached to the cart using four ropes, as shown on the figure. Force of tension in the horizontal ropes is T_1 and T_2 , and in vertical ones - T_3 and T_4 . Free fall acceleration is g . What is the acceleration of the cart?
3. Find acceleration of the blocks and tension forces in the system shown on the figure. Neglect masses of the pulley and ropes, also neglect friction.



4. A painter works on a hanging platform. He urgently needs to go up and starts pulling the rope. As a result the force with which he presses on the platform becomes less by 400 newtons. Mass of the painter is 72 kg and mass of the platform is 12 kg. Find the acceleration with which the platform and the painter move.



5. Two bodies of masses m_1 and m_2 are connected by a thread which withstands tension up to T . Bodies are acted upon by forces $F_1 = \alpha t$ and $F_2 = 2\alpha t$, where α is a constant coefficient and t is time. Find the time when the thread will be torn.



6. A system consists of N identical balls, connected by identical springs in a line and hanged vertically with a thread. Then the thread is cut. Find the accelerations of all the balls immediately after that.

FOR THE NEXT MEETING

IMPORTANT: The next club's meeting is at 3:30pm, via Zoom, on Sunday, **November 17**.