

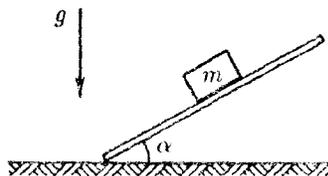
TODAY'S MEETING

Today we will discussed the force of friction.

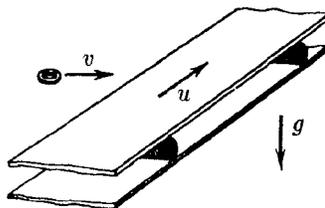
1. On an icy road friction coefficient between wheels of a car and the road is 10 times smaller than on a normal road. For what speed on an icy road the braking distance is the same as for 40 miles per hour on a normal road ?
2. A light magnet with a hook on a vertical steel wall stays at rest when a mass hanged on the hook is less than  $m_0$ . What is magnetic force if coefficient of friction between the wall and the magnet is  $\mu$ ? What will acceleration of the magnet be if a mass  $m > m_0$  is hanged from the hook?
3. A body of mass  $m$  on a horizontal plane is acted upon with a force  $F$  directed at an angle  $\alpha$  to the horizon. Friction coefficient is  $\mu$ . Find acceleration of the body if it is not lifted above the plane.

HOMEWORK PROBLEMS

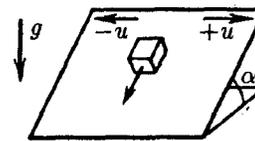
1. On a horizontal plane with friction coefficient  $\mu$  lies a body of mass  $m$ . The plane is slowly inclined all the way up to  $90^\circ$ . Find how the friction force between the body and the plane depends on the angle  $\alpha$  which the plane makes with the horizon.
2. A horizontal conveyor belt is moving with speed  $u$ . A puck flies on the belt with the initial velocity  $v$  perpendicular to the belt. Find the maximal width of the belt at which the puck still will reach the other side of the belt if friction coefficient between the puck and the belt is  $\mu$ .
- \*3. Two pucks are hit in such a way that their centers have the same initial velocity, but in addition one of them is rotating around its' center. Which of them will move farther on a horizontal surface with friction?
- \*4. An inclined plane is going back and forth along itself horizontally, very quickly changing its' speed between  $u$  and  $-u$  (you may neglect time it takes to change the speed and assume that it could only have these two values), as shown on a picture. A body is moving on this plane with constant speed downwards. Find this speed, if coefficient of friction is  $\mu$ , inclination angle of the plane is  $\alpha$  and  $\mu < \tan \alpha$ .



To homework problem 1



To homework problem 2



To homework problem 4

IMPORTANT

There is no club on December 1. The next club meeting is on December 8, 2019.