TODAY'S MEETING

Today's topic is energy conservation law.

HOMEWORK

1. Solve the following problems from the previous F = ma exams:
   8, 14, 23, 24 (2013: https://www.aapt.org/physicsteam/2014/upload/exam1-2013-1-6-unlocked.pdf)

2. A cart goes down the smooth rails which are curved in a vertical loop of radius R. The cart starts moving from rest at height h above the lowest point and stays on the rails for the whole way. What is the minimal h such that it is possible?
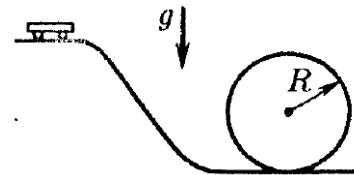

3. Two balls with masses m_1 and m_2 are going towards one another with speeds v_1 and v_2 respectively. What maximal possible amount of heat can be released during their collision?

4. A block is in equilibrium on a vertical spring with spring constant k. A part of this block of mass m is detached from it. Up to what height will the rest of the block go?
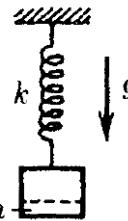
5. In a system shown on the figure the central block is attached to the center of the rope connecting the other two blocks and initially is held at rest. Find the maximal deviation of the central block from its' initial position during the subsequent motion after it is released.
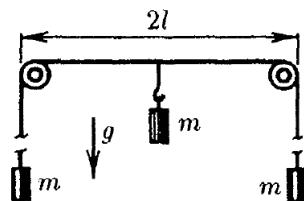
*6. A uniform smooth rope of mass m and total length l is initially at rest hanging on a small pulley in equilibrium, with exactly $l/2$ on each side, as shown on the figure. Then the rope is displaced just a bit and as a result it starts moving. With what force does the rope act on the pulley when its' length on one side is $l/3$?
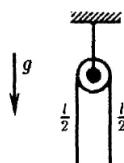
FOR THE NEXT MEETING

IMPORTANT: The next club's meeting is at 3pm, in-person on Sunday, **January 18**.