Hint 2

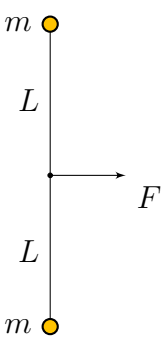
IMPORTANT! The next task is both a hint and an alternative to the main task. Three important points:

1. You can continue to send the solution to the main problem.
2. At any moment before the final deadline you can start to solve the Alternative problem. If you do so, at the beginning of the solution write: *I am doing the Alternative problem!* In this case a penalty coefficient for the Alternative problem is

$$0{,}7 \cdot \sum_i \frac{k_i \cdot p_i}{10},$$

   where p_i is a point for the problem item, and k_i is a penalty coefficient for the corresponding problem's item at the moment of moving to the Alternative problem. In other words, maximal points for the alternative problem equals to the maximal points you can gain at the moment of moving to the alternative one multiplied by 0,7. Also, we remind you that a penalty coefficient can't be less than 0,1. Solutions of the main problems from that moment will not be checked. Be careful!
3. The task consists of several items. The penalty multiplier earned **before** is applied to all points. In the future, each item is evaluated as a separate task. If you send a solution without any item, this item's solution is considered as Incorrect. For more information about scoring points for composite tasks, see the rules of the Cup.

Alternative problem



1. *(2,5 points)* Two kikopucks are connected by a string with a length of $2l$ and rest on ice. The string starts to be pulled by the middle with a constant horizontal force F. Find how much heat will be released during the perfectly inelastic collision of pucks.
2. *(1,5 points)* The kikopuck, which rested on the board, starts to be pulled with a constant force F. The board is located on a smooth horizontal surface. Find the total work of inertial forces in the center of mass frame of the board and puck.
3. *(2 points)* The center of mass of a system of N material points moves with an acceleration a. Find the total work of inertial forces in the center-of-mass frame.
4. *(2 points)* Solve part 5 of the main problem with $k = 0$, and $k = 1$.
5. *(2 points)* Solve part 6 of the main problem for $k = 0{,}5$.