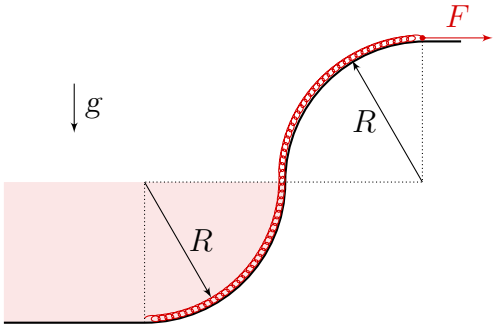
Hint 2

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 by **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. *(5 points)* A thin massive chain of mass M lies on a smooth surface (see figure). The lower half of the chain is in a liquid with a density, which is three times less than the density of the chain material. The surface consists of two parts, which are the quarters of a circle of the same radius. What force F needs to be applied to the upper end of the chain so that it doesn't slip. The gravitational acceleration is g.



2. *(5 points)* A Solenoid has the shape of a cylinder with an area S and a winding density $n = N/I$. An electric current I flows through the solenoid. A rod with an area S and permeability μ is inserted into the solenoid up to the middle. Calculate the force with which the rod is drawn into the solenoid.