Hint 2

Friends, we are glad to present you with a set of problems that can help you to solve the main problem and earn additional points when solving an alternate. We remind you that unlike the first five rounds of the LPR Cup, here, when switching to an alternative problem, the points for the main problem do not cancel but are added to the points for the main problem. Also, you can send both the main and alternative problems.

1. *(0 points)* A thin rod with a constant cross-area consists of two parts. The first part has a length $l_1 = 10$ cm and a density of $\rho_1 = 1{,}5$ g/cm^3, while the second one has a density of $\rho_2 = 0{,}5$ g/cm^3. For what length l_2 of the second part the rod will float on the water (density $\rho_0 = 1$ g/cm^3) in a vertical position.
2. *(0 points)* Pay attention to the fact that the paper plane from the main task is a passenger plane. Try using additional equipment to accommodate passengers (or one large passenger) in the cabin of the plane and analyze how the flight of our Airbus will change.
3. *(10 points)* Build a plane model from a sheet of $A4$ paper (or less), which will stay in the air for as long as possible on a free flight. Launch of the plane should be made from about 1 meter 80 cm above the ground. Scissors and glue are allowed. Nothing else in the plane making can be used. The fact of a long free flight must be confirmed by a video file that can be uploaded to Google disk and provided to us with a link. The plane must have any of the LPR Cup signs (painted lion, DGAP logo, or anything else).