



Problems for 14.11.2025
(Senior Day)

Solutions to the problems below
will be published on Monday, 17.11.2025



Problem 1. Grandma bakes spherical doughnuts of radius R . Inside each doughnut there is an empty spherical cavity of radius r . The doughnut content in a doughnut (the ratio of the volume occupied by dough to the total volume of the doughnut) is $\frac{1}{2}$. Find r as a function of R .



Problem 2. Grandma plans to serve coffee with milk. In the cupboard there are cups shaped like cones of height H . To what height h should the coffee be poured so that the coffee content in coffee (defined analogously to the doughnut content) equals $\frac{1}{2}$?

Good luck!

We encourage you to submit your solutions via
[https://mathlovers.eu/submit-solution/!](https://mathlovers.eu/submit-solution/)