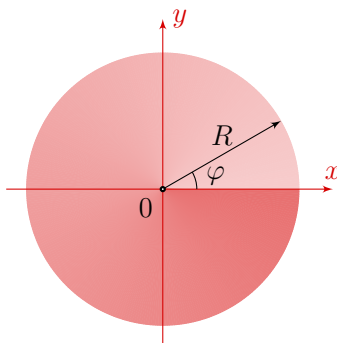




*I'll show them how to offend Cheburashkas!
The poor poachers!
Shapokliak*

Cheburashka's birthday

Cheburashka's ear has a form of a disc with a radius R and a width h (see a figure below). It has a density that is distributed according to the equation $\rho = \rho_0 \frac{\varphi}{2\pi}$, and its temperature is $T = T_0 \left(1 + \frac{\varphi}{2\pi}\right)$, where T_0 and ρ_0 are known constants, $\varphi \in (0; 2\pi]$.



1. (2 points) What is a mass m of Cheburashka's ear?
2. (4 points) Find coordinates x and y of its center of mass.
3. (4 points) Find a settled temperature T_1 of Cheburashka's ear. Consider it in thermal insulation. Specific heat of Cheburashka's ear does not depend on coordinates and temperature.

Problem's author: Maxim Eskin.

First hint — 03.05.2021 14:00 (GMT+3)

Second hint — 05.05.2021 14:00 (GMT+3)

End of the first tour — 07.05.2021 22:00 (GMT+3)