

Physics Cup 2017 - Problem 1. April 9, 2017

Estimate by the order of magnitude the interaction force between a point charge q and a circular metallic disc of radius r if the charge is at the axis of the disc, and the distance between the disc and the charge is $L \gg r$. The total charge of the disc is 0 and the thickness of the disc is negligibly small.

Notice: If you want to aim for the best-solution-bonus for this problem, you can try calculating this force exactly, it can be done! However, finding an exact numerical factor is a very difficult task, so the recommendation is to first find and submit an estimate (otherwise you will lose the points for speed), and then take your time to try finding an exact solution.