J01E.1—Resistance Between Two Points on a Disk

Problem

Calculate the resistance between two contacts on the rim of a disk of radius a, thickness $t \ll a$, and conductivity σ, when each (perfectly conducting) contact extends for a small distance δ around the circumference, and the distance along the chord between the contacts is $d \gg \delta$.

The contacts set up semicircular regions of radius $\delta/2$ of nearly uniform potential that extend into the resistive disk.