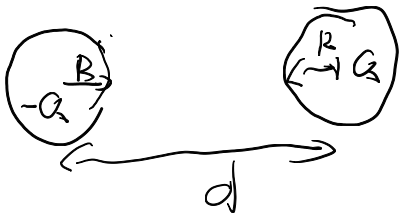
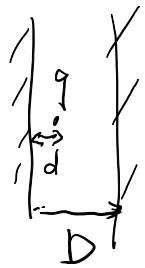
1. For 2 charges q_1, $-q_2$ separated by distance d. if $|q_1| > |q_2|$
find the radius of circle with equal potential near $-q_2$

2. Use image charges to derive the expression of capacity C between 2 balls, radius R, distance between centres d.



3. A capacitor is of thickness D.
A charge q locates distance d from one electrode



Find surface charge induced by image charges

4. Repeat question 3

with a voltage source

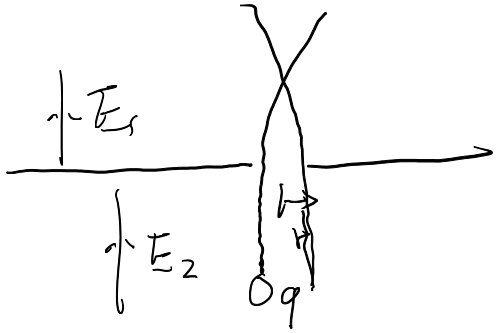
(find the work done first)

5. Derive potential ϕ near (0, 0, 0) using 2nd-order expansion.

(a) 4 charges q at $(\pm 1, \pm 1, 0)$

(b) 8 charges q at $(\pm 1, \pm 1, \pm 1)$

6.



E_1, E_2 are uniform E-field along z-axis, a charge q passes through a hole of radius r into E_1. Find the focal point with kinetic energy KE