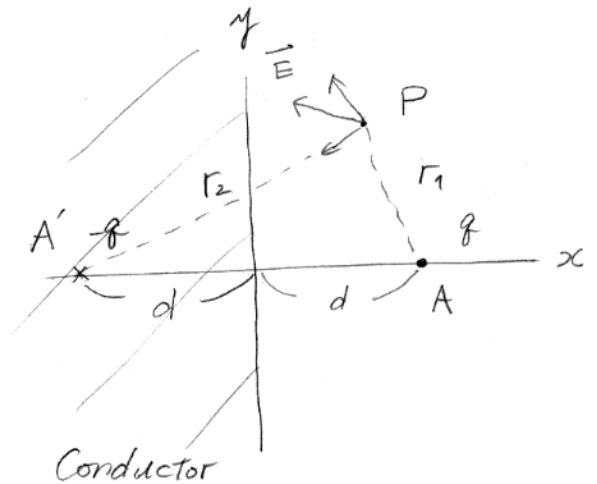


The method of image.

① Find the potential.

$$V = \frac{q}{4\pi\epsilon_0} \left( \frac{1}{r_1} - \frac{1}{r_2} \right)$$

$$= \frac{q}{4\pi\epsilon_0} \left( \frac{1}{\sqrt{(x-d)^2 + y^2}} - \frac{1}{\sqrt{(x+d)^2 + y^2}} \right)$$



② Find the force between the surface of conductor and the charge.

$$F = \frac{1}{4\pi\epsilon_0} \frac{(-q) \cdot q}{(2d)^2} \leftarrow \text{distance between them.}$$

$$= -\frac{q^2}{16\pi\epsilon_0 a^2}$$

③ Find the electric field.

$$E = -\nabla V = -\frac{\partial}{\partial x} V$$

$$= -\frac{dq}{2\pi} \frac{1}{(d^2 + y^2)^{3/2}}$$