LPR Cube

11.s02.e02

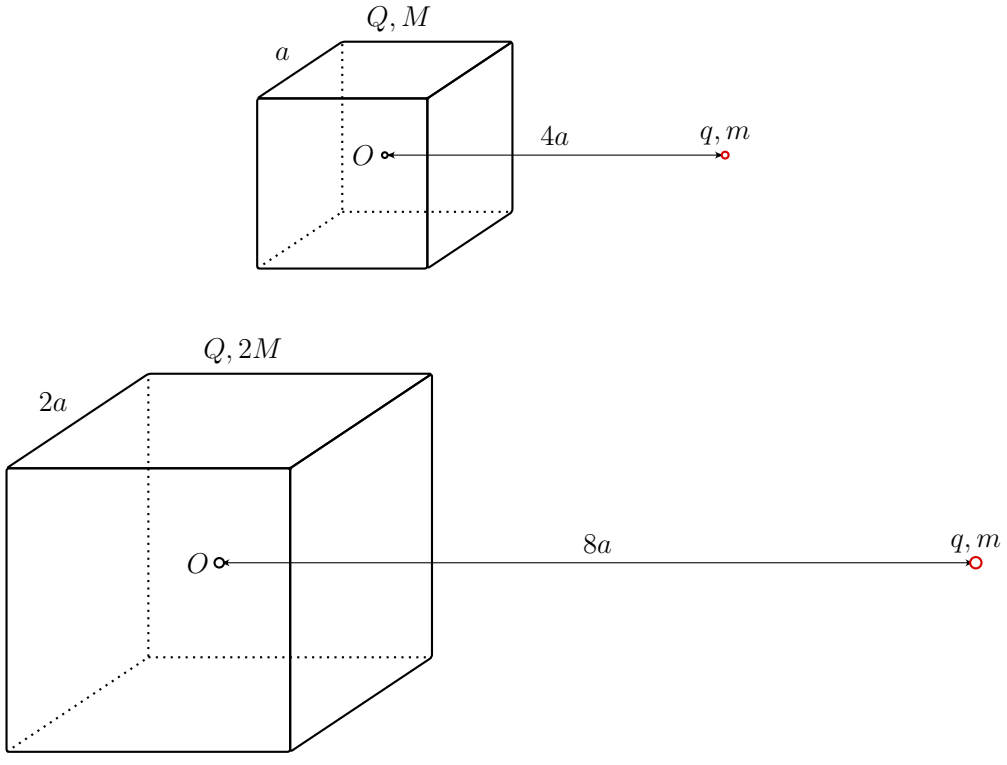
A being who is three Persons while remaining one Being,
just as a cube is six squares while remaining one cube.
Clive Staples Lewis

Cube in a cube

At a distance of $4a$ from a solid perfectly conducting Cube with side a and charge Q, a point-charge q is located on a line passing through the center of the Cube and the center of one of its faces (see fig.). The Cube's mass is M, a mass of the charge is m. The initial velocities of the Cube and the charge are equal to zero. The Cube and the charge are released, as a result, the distance between them changes twice in time t.

Find the time it takes to change the distance twice between the same point-charge and perfectly conducting Cube with side $2a$, mass $2M$ and charge Q, if the charge is located on a line passing through the center of the Cube and the center of one of its faces at a distance of $8a$ (see fig.). The initial velocities of the Cube and the charge are zero.

Note. The distance between the Cube and the point-charge is measured from the center of the Cube. Neglect gravitational and magnetic interactions.



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First hint — 10.05.2021 14:00 (GMT+3)
Second hint — 12.05.2021 14:00 (GMT+3)

End of the second tour — 14.05.2021 22:00 (GMT+3)