

# Workbook



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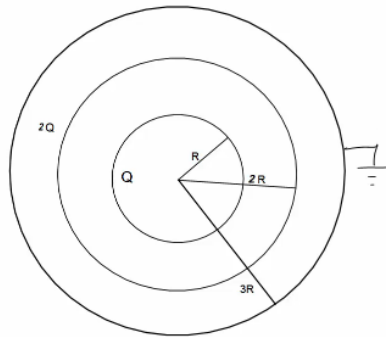
# Electrostatic Energy

## Electrostatic Energy

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### Questions

- 1) Three concentric spherical shells of radius  $R$ ,  $2R$  and  $3R$  are charged with charges  $Q$  and  $2Q$  respectively. The outer spherical shell ( $3R$ ) is not charged but is grounded. Calculate the electrostatic energy of the system.



- 2) Two spherical drops of water each have a radius  $R$  and a uniform surface charge  $Q$ . The two water droplets are joined together to form a new, larger water droplet. The charge is still uniformly distributed on the surface.
- What are the two smaller droplets' electric potential energy before being joined together?
  - What is the electric potential energy of the large droplet?
  - What is the electric potential energy of the system of two droplets right before they were joined together (the droplets are almost touching each other)? Assume that the charge distribution is still uniform.
  - What is the relationship between your answers to questions 2 and 3?

\*For the solutions go see the videos