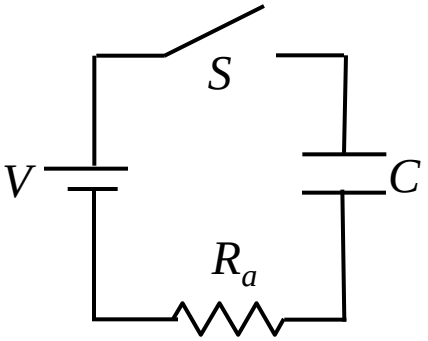
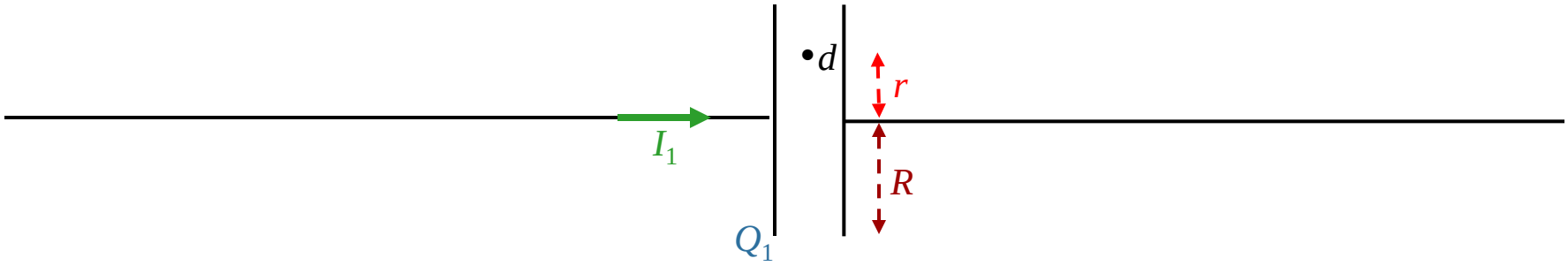
Calculation

Switch S has been open a long time when at $t = 0$, it is closed. Capacitor C has circular plates of radius R. At time $t = t_1$, a current I_1 flows in the circuit and the capacitor carries charge Q_1.

At time t_1, what is the magnetic field B_1 at a radius r (point d) in between the plates of the capacitor?





Conceptual and Strategic Analysis

Charge Q_1 creates electric field between the plates of C

Charge Q_1 changing in time gives rise to a changing electric flux between the plates

Changing electric flux gives rise to a displacement current I_D in between the plates

Apply (modified) Ampere's law using I_D to determine B