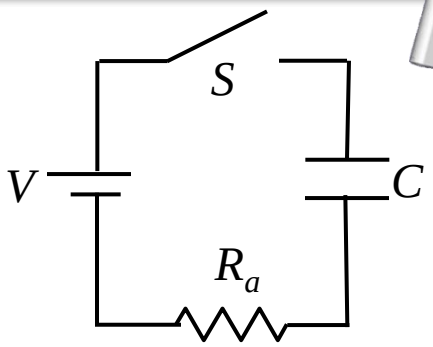
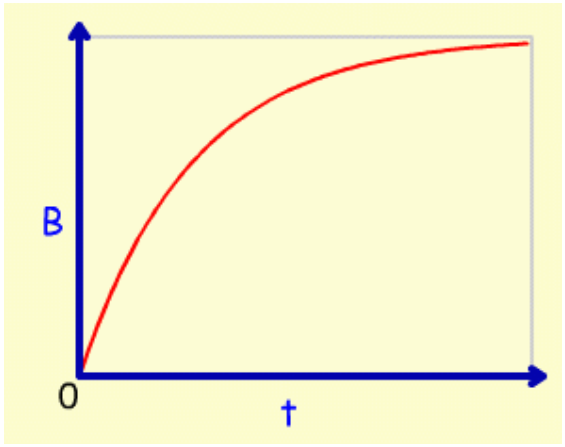
Follow-Up

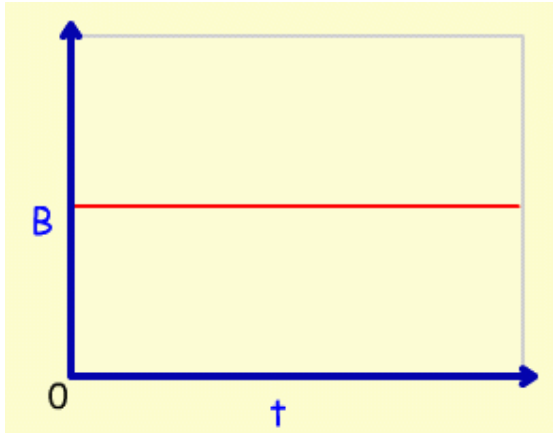
Switch S has been open a long time when at $t = 0$, it is closed. Capacitor C has circular plates of radius R. At time $t = t_1$, a current I_1 flows in the circuit and the capacitor carries charge Q_1.

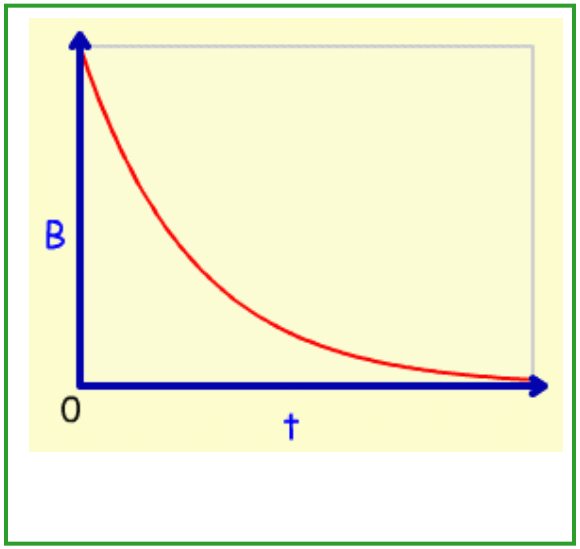
What is the time dependence of the magnetic field B at a radius r between the plates of the capacitor?



$$B_1 = \frac{\mu_0 I_1}{2\pi}\frac{r}{R^2}$$







B at fixed r is proportional to the current I

Close switch: $V_C = 0 \Rightarrow I = V/R_a$ (maximum)

I exponentially decays with time constant $\tau = R_a C$