Electric circuits
Non-assessed Problem Sheet Week 5, Capacitors

1. In the circuit shown below:
   (a) What is the initial battery current immediately after the switch is closed?
   (b) What is the battery current a long time after the switch is closed?
   (c) What is the maximum voltage across the capacitor?
   (d) If the switch has been closed for a long time and is then opened, deduce an expression for the current through the 600 kΩ resistor as a function of time.
   (e) What is the energy dissipated in the 600 kΩ resistor after the switch is opened?
   (*Note* that 1 kΩ = 10^3 Ω; 1 MΩ = 10^6 Ω; 1 μF = 10^{-6} F.)