This problem concerns resistors and capacitors in a circuit. The capacitor \( C_1 \) below has a charge of 1 \( \mu \text{C} \).

![Circuit Diagram]

a) What is the potential difference between points A and B? (The circuit is as drawn, with A and B the ends of the wires).

b) Now a 9V battery is connected to the circuit, the + terminal to A and the – terminal to B. What is the current through \( R_1 \) immediately after connecting the battery?

c) After a very long time, with the battery still connected, what is the total amount of charge that has flowed from the battery through \( R_1 \)?

d) After this very long time, the battery is disconnected, with terminals A and B open again. How much energy is stored in the capacitor?
With the capacitor charged as in d) above, a 50kΩ resistor is connected between A and B as shown.

\[ R_1 = 100 \, \text{KΩ} \]
\[ C_1 = 1 \, \text{µF} \]
\[ R_2 = 50 \, \text{KΩ} \]

\[ e) \] Immediately after connecting \( R_2 \), what is the current flowing through \( R_1 \)?

\[ f) \] What is the time constant for the decay of the current through \( R_1 \)?

\[ g) \] What is the total energy dissipated by both resistors during the discharge?