An isolated capacitor of unknown capacitance C has been charged to a potential difference of 100 V. When the charged capacitor is then connected in parallel to an initially uncharged 10 μF capacitor (μ stands for 10^{-6}), the voltage across the combination is 30 V.

$V_{ab}=100$

a•———||———•b

C?

before

$V_{cd}=30$ C?

c•————||————•d

$C_1=10\mu F$

after
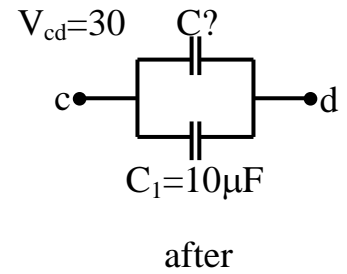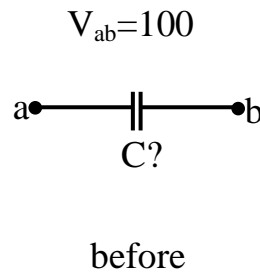
(a) Calculate the unknown capacitance.

(b) Calculate the energy $U_{initial}$ stored in the isolated capacitor when it was charged to 100 V, and the total energy U_{final} stored in the parallel combination of the two capacitors.