In the arrangement shown, $S_A$ is originally closed, and $S_B$ is open. Then $S_A$ is opened, followed by closing $S_B$. With $S_B$ closed, find

(a) the charge on each capacitor.
(b) the voltage across each capacitor.
(c) Leaving $S_B$ closed, close $S_A$. How much additional charge flows through $S_A$?

\[ V = 150 \, \text{V} \]
\[ C_1 = 25 \, \text{pf} \]
\[ C_2 = 30 \, \text{pf} \]
\[ C_3 = 50 \, \text{pf} \]

\[ q = C_1 V = C_{eq} V' \]
\[ C_{eq} = C_1 + \frac{1}{C_2 + C_3} = 44 \, \text{pf} \]

\[ V' = \frac{C_1 V}{C_{eq}} = \frac{25}{44} \cdot 150 \, \text{V} = 86 \, \text{V} \]

\[ q_2 = q_3 = V' \frac{1}{C_2 + C_3} = 86 \cdot \frac{1}{50 \times 10^{-12} + 30 \times 10^{-12}} = 1.6 \times 10^{-9} \, \text{C} \]

\[ q_1 = C_1 V' = 25 \times 10^{-12} \times 86 = 2.1 \times 10^{-9} \, \text{C} \]

\[ V_2 = \frac{q_2}{C_2} = \frac{1.6 \times 10^{-9}}{30 \times 10^{-12}} = 54 \, \text{V} \]

\[ V_3 = \frac{q_3}{C_3} = \frac{1.6 \times 10^{-9}}{50 \times 10^{-12}} = 32 \, \text{V} \]

\[ \Delta q = C_{eq} V - C_{eq} V' = 44 \times 10^{-12} (150 - 86) = 2.8 \times 10^{-9} \, \text{C} \]