SHOW ALL WORK!!!!!
REPORT ALL NUMBERS TO THREE SIGNIFICANT FIGURES!
Use the conversion constants and data given on the front page.

Given the circuit shown:

(a) Calculate the equivalent capacitance between points A and B.
(b) If the battery potential is 315 volts, what is the potential across \( C_6 \)?
(c) If the battery is 315 volts, what is the potential across \( C_6 \)?
(d) If the battery is 315 volts, what is the charge on \( C_2 \)?

Note: Keep 4 significant figures in intermediate calculations.

\[
\begin{align*}
C_1 &= 2.50 \text{ pF} \\
C_2 &= 3.50 \text{ pF} \\
C_3 &= 2.00 \text{ pF} \\
C_4 &= 3.00 \text{ pF} \\
C_5 &= 5.00 \text{ pF} \\
C_6 &= 7.00 \text{ pF}
\end{align*}
\]

\[
\begin{align*}
a) \quad C_{eq} &= \left( \frac{1}{C_6} + \frac{1}{C_3} \cdot \frac{1}{C_4} + \frac{1}{C_1 + C_2} \right)^{-1} = \frac{2.44 \text{ pF}}{}
\end{align*}
\]

\[
b) \quad Q_6 = Q_{eq} = \Delta V C_{eq} = (315)(2.44) = \frac{7.69 \times 10^{-10} \text{ C}}{}
\]

\[
c) \quad V_4 = \frac{Q_4}{C_4} = \frac{7.69 \times 10^{-10} \text{ C}}{10 \text{ pF}} = 76.9 \text{ V}
\]

\[
d) \quad \Delta V_1 = \Delta V_2 = \frac{Q_{eq}}{C_1 + C_2} = 128.2 \text{ V}
\]

\[
Q_2 = \Delta V_2 C_2 = (128.2)(3.5 \times 10^{12}) = 4.49 \times 10^{-10} \text{ C}
\]