1. For the circuit in the following figure
   a) Find the total resistor value \( R_T \)
   b) Find the current \( i \)
   c) Find the voltage over resistors
   d) Verify Kirchhoff’s voltage law

\[
R_T = 10 + 20 + 40 + 20 = 90\, \Omega
\]

\[
i = \frac{V}{R_T} = \frac{12 + 6}{90} = \frac{18}{90} = 0.2
\]

\[
= 200\, mA
\]

\[
V_1 = 10 \times 0.2 = 2V
\]

\[
V_2 = 20(0.2) = 4V
\]

\[
V_3 = 40 \times 0.2 = 8V
\]

\[
V_4 = 20(0.2) = 4V
\]

\[
V_1 + V_2 - 6 + V_3 + V_4 - 12 = 0
\]

\[
2 + 4 - 6 + 8 + 4 - 12 = 0
\]