It is easy to see that all the circuit diagrams shown on the right are electrically equivalent although their physical layouts seem different. This is because the nodes C, E, and D are all at the same potential. Also, the nodes A, F, G, and H are all at the same potential. The KVL for the loop HCEFH gives us the equation,

\[ 4i_1 + 2i_1 - 16i_2 = 0 \Rightarrow 6i_1 = 16i_2 \Rightarrow i_1 = \frac{8i_2}{3}. \]

The KVL for the loop ABEFA gives us the equation,

\[ v_x - 2 - 16i_2 = 0 \Rightarrow v_x = 2 + 16i_2. \]

The KCL at the node C=D=E gives us the equation,

\[ 3i_2 - i_1 - i_2 + 2 = 0 \Rightarrow 2i_2 - i_1 = -2. \]

Substituting \( i_1 = \frac{8i_2}{3} \) into the above equation, we get

\[ 2i_2 - \frac{8i_2}{3} = -2 \Rightarrow i_2 = 3 \text{ Amps}. \]

This in turn yields, \( i_1 = \frac{8i_2}{3} = 8\text{Amps} \) and \( v_x = 2 + 16i_2 = 50 \text{ Volts} \). The power is generated by the 2A independent source and it equals \( 50 \times 2 = 100 \text{ Watts} \).

**Home-work** As an exercise, compute the power generated or consumed by each element and then verify that the total power generated equals the total power consumed.