**Problem 3.18**  Repeat Problem 3-17 after replacing the 2-Ω resistor in Fig. P3.18 with a short circuit.

![Figure P3.18: Circuit for Problems 3.17 and 3.18.](image)

**Solution:** We now have only two nodes, $V_1$ and $V_3$. Hence,

\[
\frac{V_1 - 8}{1} + \frac{V_1 - V_3}{4} + \frac{V_1}{1} + \frac{V_1 + 2I - V_3}{6} = 0 \quad (1)
\]

\[
\frac{V_3 - V_1}{4} + \frac{V_3 - V_1 - 2I}{6} + \frac{V_3}{1} = 0, \quad (2)
\]

and

\[
I = \frac{V_1}{1} = V_1. \quad (3)
\]

The solution is:

\[
V_1 = 3.16 \text{ V}, \quad V_3 = 1.67 \text{ V},
\]

and

\[
V_x = V_2 = 1.67 \text{ V}.
\]