Selected Problems, Chapter 2 Smith & Dorf, 5th ed.

Note: Some solutions are outlined, with detail omitted.

**P2-3**

\[ -V_1 + i_1 R_1 + V_2 = 0 \quad \text{(KVL and Ohm's Law)} \]

\[ -i_2 R_2 + V_2 = 0 \quad \text{(KVL and Ohm's Law)} \]

**P2-4, P2-5**

\[ i_2 + i_b + i_c = 0 \quad \text{(KCL)} \]

\[ i_1 - i_2 = i_b - i_c \quad \text{(KCL)} \]

\[ V = 3i_2 - 4i_b \quad \text{(KVL and Ohm's Law)} \]

**P2-10**

\[ l_2 \text{ is another name for the current through the current source, i.e., } l_2 = -2. \]

\[ 30 = 5i_1 + 3(i_1 - l_2) \quad \text{(KVL and Ohm's Law)} \]

Solve for \( l_1 = 3a \), and so the voltage across the 3Ω is 15V.

**P2-20**

\[ V = \frac{10 \cdot l_2}{(10||l_2) + 10} \quad (24) \]

zero resistance voltmeter calibrated to read voltage across series 10kΩ

**P2-25**

\[ 3||6 = 2Ω \]

\[ \frac{6}{3 + 6} = \frac{70}{3} \]

\[ I = \frac{42 - \frac{70}{3}}{12 + 2} = \frac{4}{3} \text{A} \]