1. \[ i_a = \underline{\text{_______}} \quad \text{A}, \quad i_b = \underline{\text{_______}} \quad \text{A}, \]
\[ i_2 = \underline{\text{_______}} \quad \text{A}, \]
\[ v_1 = \underline{\text{_______}} \quad \text{V} \]

2. The current in the 20-\( \Omega \) resistor is \( i_a = \underline{\text{_______}} \quad \text{A} \).

The voltage across the 10-\( \Omega \) resistor is \( v_b = \underline{\text{_______}} \quad \text{V} \).

The (independent) voltage source current is \( i_c = \underline{\text{_______}} \quad \text{A} \).

3. The Ohmmeter measures equivalent resistance.
   a. To cause \( R_{eq} = 12 \ \Omega \), choose \( R = \underline{\text{_______}} \quad \Omega \).
   b. If \( R = 14 \ \Omega \) then \( R_{eq} = \underline{\text{_______}} \quad \Omega \).

4. Consider this combination of resistors. Let \( R_p \) denote the equivalent resistance.
   a. Suppose \( 40 \ \Omega \leq R \leq 400 \ \Omega \). Determine the corresponding range of values of \( R_p \):
      \[ \underline{\text{_______}} \quad \Omega \leq R_p \leq \underline{\text{_______}} \quad \Omega \]
   b. Suppose instead \( R = 0 \) (a short circuit). Then \( R_p = \underline{\text{_______}} \quad \Omega \).
   c. Suppose instead \( R = \infty \) (an open circuit). Then \( R_p = \underline{\text{_______}} \quad \Omega \).
   d. Suppose instead the equivalent resistance is \( R_p = 80 \ \Omega \). Then \( R = \underline{\text{_______}} \quad \Omega \).
5. Here’s a single circuit drawn in four parts for convenience. The four parts are connected by the dependent sources. Given that $i_1 = 0.8$ A, determine the values of $R_1$, $v_2$, $v_3$, and $i_4$.

\[
R_1 = \underline{\phantom{0000}} \, \Omega, \quad v_2 = \underline{\phantom{0000}} \, V, \quad v_3 = \underline{\phantom{0000}} \, V \quad \text{and} \quad i_4 = \underline{\phantom{0000}} \, A.
\]

6. Encircled numbers are node numbers. The corresponding node voltages are:

\[
v_1 = 12 \, V, \quad v_2 = 10.5 \, V \quad \text{and} \quad v_3 = 6 \, V
\]

The value of the gain of the CCCS is $k = \underline{\phantom{0000}} \, \text{A/A}$.

The resistance of the resistor at the top of the circuit is $R = \underline{\phantom{0000}} \, \Omega$. (Round to an integer.)

The power supplied by the independent (0.1 A) current source is \underline{\phantom{0000}} \, \text{W}.

7. Let $i_1$, $i_2$ and $i_3$ denote the mesh currents in meshes 1, 2 and 3, respectively.

Determine the values of these mesh currents:

\[
i_1 = \underline{\phantom{0000}} \, \text{A} \quad \text{and} \quad i_2 = \underline{\phantom{0000}} \, \text{A}
\]

Determine the value of the resistance $R$:

\[
R = \underline{\phantom{0000}} \, \Omega
\]