2.14 The voltage and current were measured at the terminals of the device shown in Fig. P2.14(a). The results are tabulated in Fig. P2.14(b).

a) Construct a circuit model for this device using an ideal current source and a resistor.

b) Use the model to predict the amount of power the device will deliver to a 20 Ω resistor.

Figure P2.14

\[
\begin{array}{c|c}
 v_r (V) & i_r (A) \\
 100 & 0 \\
 120 & 4 \\
 140 & 8 \\
 160 & 12 \\
 180 & 16 \\
\end{array}
\]

2.19 Given the circuit shown in Fig. P2.19, find

a) the value of \( i_a \),
b) the value of \( i_b \),
c) the value of \( v_r \),
d) the power dissipated in each resistor,
e) the power delivered by the 50 V source.

Figure P2.19

2.23 For the circuit shown in Fig. P2.23, find (a) \( R \) and (b) the power supplied by the 240 V source.
2.30 For the circuit shown in Fig. P2.30, calculate (a) \( i_\Delta \) and \( v_o \) and (b) show that the power developed equals the power absorbed.

3.4 Find the equivalent resistance seen by the source in each of the circuits of Problem 3.2.

3.6 Find the equivalent resistance \( R_{ab} \) for each of the circuits in Fig. P3.6.
3.11 For the circuit in Fig. P3.11 calculate
   a) $v_o$ and $i_o$.
   b) the power dissipated in the 6 Ω resistor.
   c) the power developed by the current source.

**Figure P3.11**

3.19 a) The voltage divider in Fig. P3.19(a) is loaded with the voltage divider shown in Fig. P3.19(b); that is, a is connected to a', and b is connected to b'. Find $v_o$.

b) Now assume the voltage divider in Fig. P3.19(b) is connected to the voltage divider in Fig. P3.19(a) by means of a current-controlled voltage source as shown in Fig. P3.19(c). Find $v_o$.

c) What effect does adding the dependent-voltage source have on the operation of the voltage divider that is connected to the 380 V source?
The current in the 12 Ω resistor in the circuit in Fig. P3.30 is 1 A, as shown.

a) Find \( v_{r} \).

b) Find the power dissipated in the 20 Ω resistor.