**Ideal Transformer**

Assume:

1) \( k = 1 \)
2) \( L_1 = L_2 = \infty \)
3) \( R_L = R_L' = 0 \)

\[
\frac{V_1}{N_1} = \frac{V_2}{N_2}, \tag{9.83}
\]

\[
I_1 N_1 = I_2 N_2. \tag{9.86}
\]

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**Figure 9.42** The graphic symbol for an ideal transformer.

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**Figure 9.43** Circuits that show the proper algebraic signs for relating the terminal voltages and currents of an ideal transformer.

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**Figure 9.47** Using an ideal transformer to couple a load to a source.

\[
Z_{\text{in}} = \frac{V_i}{I_i}
\]