4.

Given $N_1/N_2 = 7$, calculate the equivalent impedance, $z_{eq} = V_s/I_s$, to the right of the a and b terminals in the above transformer circuit. Note: the transformer is ideal.

**SOL’N:** The equivalent impedance of the circuit to the right of the a and b terminals is the reflected impedance given by the square of turns ratio times the secondary load impedance:

$$z_r = \left( \frac{N_1}{N_2} \right)^2 z_L = 7^2 (-2 \, \text{k}\Omega) = -98 \, \text{k}\Omega$$

**NOTE:** Since the primary and secondary are isolated from one another, we could redraw the secondary side right side up without changing the circuit behavior.