In all the circuits asking for the Thevenin or Norton Equivalent below, the equivalent should be of the circuit between terminals A and B.

1. What is the Thevenin equivalent of this circuit?

\[ V_{TH} = 1.333V \quad R_{TH} = 0.89\Omega \]

2. What is the Thevenin equivalent of this circuit?

\[ V_{TH} = -0.8182V \quad R_{TH} = 1.65 \] Note change in polarity of dependent source.

3. What is the Norton equivalent of this circuit?

\[ I_N = 0A \quad R_N = 0.15\Omega \]
4. What is the Norton equivalent of this circuit?

\[ I_N = -1.808A \text{ (pointing down)} \]
\[ R_N = 9.37\Omega \]

5. This is a model of a transistor amplifier. What \( R_L \) will receive the most power from it? What is that power in terms of \( V_s \)?

\[ R_L = 472.3\Omega \]
\[ P = 0.943V_s^2 \]

6. What \( R_L \) will receive the most power from this bridge circuit? What is that power in terms of \( V_s \)?

\[ R_L = 133.3\Omega \]
\[ P = 2.0833E^{-4}V_s^2 \] That is 0.00020833\( V_s^2 \)
7. Your boss brings you another black box. It has two terminals. She wants you to model it. You may not short out the two terminals. In fact, you may draw or input no more than 0.1A in or out of them.

In the lab you measure the open circuit voltage as 1.5V. You place a 100Ω resistor across the terminals and the voltage across the resistor is 1.3V. What is the Thevenin equivalent circuit of the box? What is the Norton equivalent circuit?

\[ V_{TH} = 1.5V \quad R_{TH} = 15.38Ω \]

\[ I_N = 0.098A \text{ (pointing up)} \quad R_N = 15.38Ω \]

8. You want to use power source A and power source B to deliver power to a load. Each source’s Thevenin equivalent is shown below. What is the Thevenin equivalent circuit of A and B in parallel?

\[ V_{TH} = 12.06V \quad R_{TH} = 1.2Ω \]

9. Try Problem 8 by converting each source to its Norton equivalent and paralleling them. Then convert back to Thevenin. Is this easier?

Same as Problem 8

10. You have an ideal source (R_{TH} = 0) of 100V in the lab. Design a voltage divider to reduce the voltage to 25V. The Thevenin equivalent circuit should look like this:

\[ V_{TH} = 25V \]

How much power does the voltage divider absorb?

\[ R_1 = 300Ω \quad R_2 = 100Ω \quad P = 25W \]
11. Use any method(s) that you have learned so far to determine the Norton equivalent of this somewhat complex circuit:

$I_N = -0.0472\, \text{A (pointing to B)} \quad R_N = 8.4\, \Omega$

![Circuit Diagram]