1) For $R_1 = 130 \, \Omega$, $R_2 = 560 \, \Omega$, and $R_3 = 300 \, \Omega$ in the circuit below, replace the voltage source with a short circuit and calculate the Thévenin resistance ($R_{TH}$). This is the resistance seen looking into the circuit from the right, i.e. into the + and – terminals.

$R_{TH,\,Calculated} = \underline{\text{_________}} \, \Omega$

2) For $V = 10$ volts, calculate the open-circuit voltage $V_{TH}$ at the output.

$V_{TH,\,Calculated} = \underline{\text{_________}} \, V$

3) Short the + and – terminals at the output and calculate the short-circuit current (Norton current), $I_N$.

$I_N,\,Calculated = \underline{\text{_________}} \, mA$

4) Place a resistor ($R$) across the + and – terminals at the output. Calculate the voltage $V_R$ for values of $R$ ranging from $20 \, \Omega$ to $1000 \, \Omega$. Calculate the current through $R$ and the power dissipated in $R$ for each value of $R$ and fill in the table below.
5) Using Excel, do a least squared error trendline fit to the (I, $V_R$) data in the table above to determine the Thévenin voltage, $V_{TH}$, and the Norton current, $I_N$. Plot $V_R$ (V) on the y-axis and $I_R$ (mA) on the x-axis. The Thévenin voltage is the y-intercept, i.e. the open-circuit voltage, and the Norton current is the x-intercept, i.e. the short-circuit current. The slope of the line is the negative of the Thévenin (Norton) resistance divided by 1000. Label these points on the graph and record their values below, along with the calculated value of $R_{TH}$. Print out a copy of the graph to turn in with your pre-lab report.

\[
V_{TH} = \underline{________} \text{ V} \quad \quad \quad I_N = \underline{________} \text{ mA} \\
R_{TH} = \underline{________} \text{ } \Omega \quad \quad \quad r^2 = \underline{________}
\]