1) A black box with one terminal pair has the v-i characteristic provided in the figure below. Find Thevenin and Norton equivalents for this device. Your answers must include both circuit diagrams and the values of all elements in them. Explain your methods fully.

![v-i characteristic graph]

2) Use nodal analysis to obtain an algebraic expression for the voltage \( v \) in the circuit below. Do not attempt to simplify your expression.

![circuit diagram]
3) For the resistive circuit below, use the superposition principle to find the current $i$. Thoroughly explain your method in words and appropriate circuit diagrams.

4) For the circuit below, use values and uncertainties provided to calculate (a) the nominal value* of the voltage $v_{out}$ in Volts and (b) its uncertainty in ±%. For part (b), you must fully explain your method. Note that the specifications of the uncertainties of resistance are given in ±%, while the uncertainty for voltage is in ± volts.

*...The nominal value is the value obtained if all component and source values are exact with no uncertainty