1. **Equivalence** Find the Thévenin and Norton equivalents across terminals $a$ and $b$ for the circuits given below.

(a)

(b)
2. **Wheatstone Bridge** Let us revisit our favorite circuit, the wheatstone bridge. Thévenin equivalence is an alternate technique we can use to solve the bridge circuit. For the circuit below, \( R_1 = 4 \text{k}\Omega, R_2 = 1 \text{k}\Omega, R_3 = 3 \text{k}\Omega, R_4 = 1 \text{k}\Omega, \) and \( R_5 = 4 \text{k}\Omega. \)

![Wheatstone Bridge Circuit](image)

(a) First, let’s for a moment remove the bridge resistor. Calculate the Thévenin equivalence between the two terminals of the resistor \( v_2 \) and \( v_3 \).

(b) With this equivalent circuit, calculate the current through the bridge resistor.

3. **Equivalence** Find the Thévenin and Norton equivalents of the following circuit across the terminals \( a \) and \( b \) (in terms of \( V_s \) and \( \beta \)). Note that the current source is dependent on the current \( I_x \).

![Equivalence Circuit](image)