1. **Equivalence** Find the Norton equivalent 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 \( I_x \).

\[
\begin{align*}
V_s & \quad \quad 10k\Omega \quad I_x \\
\beta \cdot I_x & \quad 100k\Omega
\end{align*}
\]

2. **Superposition Practice**

For the following circuits, use the superposition theorem to solve for the node potential \( V_1 \).

(a)

(b)

(c)
3. Superposition

(a) For the circuit above, first calculate $V_{out}$ with only $V_s$ on?
(b) Now calculate $V_{out}$ with only $V_1$ on. Repeat this with only $V_2$ on.
(c) Let’s now turn on $V_s$, $V_1$ and $V_2$. What is the output $V_{out}$? What does this circuit do to arbitrary input voltages?