Lab 3 Circuit Analysis

Key assumption: \( i' = 0 \) if \( R_2 \gg R_0 \)

Under this assumption:

Here in Lab 3, \( R_2 = 100 \Omega \)
\( R_0 = 10 \Omega \)

which is OK to allow decoupling divider from RC circuit.
Exact Analysis

If we know $V_o$, then $V = V_o \frac{R_1}{R_1 + R_2}$

So: find $V_o$

DC gain: $\frac{V_o}{V_{a0}}|_{DC} = \frac{R_1 + R_2}{R_o + R_1 + R_2} = \frac{R'}{R_o + R'} \triangleq G_o$

Time constant:

$\tau_1 = (R_o || R') C_o$

If $R' \gg R_o$: $G_o \approx 1$

$\tau \approx R_o C_o$