1. Calculate \( \frac{V_0}{V_i} = T(s) \) for the filter below and show that \( |T(s)| \) is a constant. Find the value of that constant in terms of the components of the circuit.

\[ + \quad \frac{1}{R_1} \quad \frac{1}{R} \quad \frac{1}{C} \quad - \quad + \quad \frac{1}{R_1} \]

\[ V_i \]

\[ - \quad 0 \]

2. Show that the following filter is first order. Calculate \( T(s) = \frac{V_0(s)}{V_i(s)} \) and put it in the form

\[ T(s) = \frac{a_1 s + a_0}{s + w_0} \]

and calculate \( a_0, a_1 \), and \( w_0 \) in terms of \( R_1, R_2, C_1, C_2 \).