The two problems below replace Diefenderfer & Holton, Chapter 3, Problem 24:
D&H problem 3-24 as stated has a typo. There should be an absolute value bracket around the right-
side, and a "j" in front of the \( \omega CR_2 \) term.
Here is the actual problem that you should solve, the first part is the typo-corrected DH, and the second
part is additional:
1. Derive the following transfer function
expression for the circuit of Figure E:

\[
\frac{v_o}{v_s} = \frac{R_2}{R_2 + R_1(1 + j \omega C R_2)}
\]

\[\text{Figure E: Circuit for DH problems 24, 25.}\]

2. The circuit in Figure E is representative of a real-life capacitor, which is an ideal capacitor in parallel
with large resistor. Show that if \( R_2 \gg R_1 \), then terms of order \( R_1 / R_2 \) can be neglected and the gain
reduces to the simple low-pass filter gain:

\[
\left| \frac{v_o}{v_s} \right| = \frac{1}{\sqrt{1 + \omega^2 R_1^2 C^2}}
\]