Assignment 3

1. \( \frac{V_{out}}{V_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

2. \( \frac{I_{out}}{I_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

3. \( \frac{V_{out}}{V_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

4. \( \frac{I_{out}}{I_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

5. \( \frac{V_{out}}{V_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

6. \( \frac{I_{out}}{I_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

7. \( \frac{V_{out}}{V_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

8. \( \frac{I_{out}}{I_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

9. \( \frac{V_{out}}{V_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

10. \( \frac{I_{out}}{I_{in}} = \frac{1}{1 + \frac{R_2}{R_1}} \)

The above equations must be derived to have a small signal gain of \( - \frac{R_2}{R_1} \) for the circuit to be a common source amplifier. The output impedance \( Z_{out} \) for the common source amplifier is given by:

\[ Z_{out} = R_2 \]

The output impedance is very high and the output impedance is very low. The output impedance is much lower than the input impedance. The output impedance is much higher than the input impedance. The output impedance is much lower than the input impedance.