Homework Assignment 4
Worksheet: Inverting Amplifier

Homework
Cogdell: 4.32, 4.40, 4.44, 4.58

Notes
1. For the standard op amp feedback connection, the relationship between the output and input voltages follows from two basic assumptions:
   - Current is conserved
   - No current flows into the op amp (this is only true for a perfect op amp)
2. This means that the current into the 1k and 10k resistors is the same.
3. One can then show that $V_o$ is approximately $-(10k/1k) V_i$

Procedure
1. Draw the schematic shown above. Use the Motorola part.
2. Drive the circuit with a 1 V\text{pp} 1kHz sine wave. What is the gain?
3. What is the phase of the output signal relative to the input signal?
4. Now drive the input with a 5 V\text{pp} 1kHz sine wave. Does the signal look like the input? What is the gain?
5. Which of the two gains is correct? That from question 2 or question 4? Explain why.
6. Is there a maximum frequency above which the amplifier stops working well?
7. Put a 100k resistor in series with the input resistor and measure the input impedance by measuring the voltage across the new resistor compared to the voltage after the resistor to ground. Is this what you expect?