

1. Problem 13.30
2. Problem 13.35
3. 2-bit, $R - 2R$ Ladder Digital-to-Analog Converter
 - (a) Reduce the 3-bit Digital-to-Analog Converter shown in to class (and shown on page 892 of the book) to a 2-bit version. Draw the circuit.
 - (b) Find the output voltage of the op-amp in terms of the binary inputs and resistors.
 - (c) Find R_2/R_1 such that a full scale of **0-5V** (not 0-2V) can be achieved (use 5V to represent the logical value of 1).
 - (d) Assume resistors can be found such that R_2/R_1 from above can be achieved. What is the resolution of your DAC?
 - (e) Write a table for the DAC voltages versus the two binary digits as they count from 00 to 11 and their decimal equivalents.
 - (f) What binary number would be written to achieve an output voltage of 1.5V. How much error is there between the desired value of 1.5V and the actual output?
4. 10-bit Analog-to-Digital Converter with 0-5V rating
 - (a) Find the resolution of the ADC.
 - (b) What readings (in decimal) would be returned by the ADC for analog input voltages of 2V and 3V? Compute the corresponding voltages reported by the ADC using the resolution. How much error is in each voltage measurement?