

ECE 321 - Homework #1

Op-Amps, Instrumentation Amplifiers. Due Monday, October 31st

Assume ideal op-amps.

- 1) Design an op-amp circuit with a gain of +3
- 2) Design an op-amp circuit with a gain of -3
- 3) Design an op-amp circuit to implement the function

$$Y = 2X + 3$$

- 4) Design a circuit which meets the following requirements

Input: 3 voltages (A, B, C), each $\pm 5V$, 0-10kHz, capable of driving 10mA

Output: Y: $\pm 5V$, capable of driving 10mA

Relationship: $Y = 2A + 3B + 4C$

- 5) Design a circuit which meets the following requirements:

Input: Thermistor

$$R = 1000 \cdot e^{-0.05(T-25)} \Omega$$

Output: Y, 0 .. 10V signal, capable of driving 10mA

Relationship:

- At 0C, Y = 0V
- At 10C, Y = 10V
- Y is proportional to temperature for $0C < T < 10C$