use your homework simulations and analysis. For more depth, build and measure the audio amplifier on a prototyping strip with and without a real op amp.

1. Distortion is a function of supply voltage, quiescent current, and the load resistance. Use examples and your understanding of the circuit operation to choose appropriate supply voltages and quiescent currents to drive 32 ohm headphone and 8 ohm speaker loads, using a real op-amp. The LT1115 low noise-low distortion op amp in the LT spice catalog is a reasonable choice for simulations.

2. Unlike the ideal op-amp in our early simulations, a real op-amp has limited output voltage and current capability. What is the impedance presented to the op-amp output when an 8 ohm load resistor is connected, and how does this impact the design?

3. Analyze the NPN emitter follower at a quiescent current of 10 mA using the techniques presented in Chapter 8. What is the impedance looking into the base? What is the drive impedance looking back into the emitter?

4. Sketch the complete design of an audio output amplifier stage, including a real op-amp, that you can in the lab and drive a small speaker. Be prepared to discuss the function of every component in the circuit and justify your choices.