Sammy wants to choose speakers that produce very loud music. He has an amplifier and notices that the speaker terminals are labeled "**8**Ω source."

1. What does this mean in terms of the amplifier’s equivalent circuit?
2. Any speaker Sammy attaches to the terminals can be well- modeled as a resistor. Choosing a speaker amounts to choosing the values for the resistor. What choice would maximize the voltage across the speakers?
3. Sammy decides that maximizing the power delivered to the speaker might be a better choice. What values for the speaker resistor should be chosen to maximize the power delivered to the speaker?

**Problem 3.22: Big is Beautiful**



. The datarate is 10Mbps.

1. Draw a block diagram that expresses this communication scenario.
2. Find circuits that the receivers could employ to separate unwanted transmissions. Assume the received signal is a voltage and the output is to be a voltage as well.
3. Find the second transmitter's frequency so that the receivers can

suppress the unwanted transmission by at least a factor of ten.

where the amplitude is either zero or ***A*** and each transmitter uses its own frequency ***fi***. Each frequency is harmonically related to the bit

interval duration ***T***, where the transmitter 1 uses the frequency

Two transmitter-receiver pairs want to share the same digital communications channel. The transmitter signals will be added together by the channel. Receiver design is greatly simplified if first we remove the unwanted transmission (as much as possible). Each

transmitter signal has the form

**Problem 3.23: Sharing a Channel**