

AUDL 1001 Week 2 tutorial: for students

- 1) dB and all that ...
 - a) Suppose a hearing aid amplifies the amplitude of sound outside the ear by a factor of ten (i.e. so that the sound pressure in the ear is ten times higher than it is outside the ear). What would be the dB SPL level inside the ear given an external sound level of 48 dB SPL? How many Pa is both the input and the output?
 - b) Volker normally has a threshold for a 1 kHz sinusoid of 30 μPa . After visiting a disco with loud music, Volker's threshold of hearing for a 1 kHz tone is temporarily raised by 17 dB. What is his new threshold of hearing in dB SPL?
 - c) The normal threshold of hearing at 125 Hz is 632.5 μPa . Stuart has a threshold that is 7 dB better than average at this frequency. What sound pressure (in Pa or μPa) is the least intense Stuart can hear at 125 Hz? What is the normal average threshold in dB SPL at 125 Hz?

- 2) Take two sinusoids of 4 kHz, both with a phase of 0° . One has a peak level of 0.8 Pa while the other has a peak level of 0.5 Pa. Draw 3 cycles of the waveform of the larger sinusoid. What are the peak levels of the two sinusoids in dB SPL? What would be their peak level (in dB SPL) if added? What if one had a phase of 180° while the other remained at 0° ? What level would the sum of these two sinusoids be, in Pa and dB SPL?

- 3) Take two sinusoids of 2 kHz, both with a phase of 0° . One has a peak level of 1.2 Pa while the other has a peak level of 0.7 Pa. Draw 3 cycles of the waveform of the larger sinusoid. Write down the formula for converting a measurement in Pa into dB SPL. What are the individual peak levels of the two sinusoids in dB SPL? What would be their peak level (in dB SPL) if added? What if one had a phase of 180° while the other remained at 0° ? What level would the sum of these two sinusoids be, in Pa and dB SPL?