

Introduction to Acoustics
sample test problems

1. Calculate rms pressure of a sinusoid given peak pressure 50 μPa .
2. Calculate rms pressure of a sinusoid given peak-to-peak pressure 20 μPa .
3. Calculate peak pressure of a sinusoid given rms pressure 100 μPa .
4. Calculate the period of a sinusoid if the frequency is 2 kHz.
5. Calculate the frequency of a sinusoid if the period is 2 ms.
6. Draw a sine wave with frequency 5 Hz, peak amplitude 2 and phase angle 0. Label axes.
7. Draw a sine wave with frequency 1000 Hz, rms amplitude 1 and phase angle $\delta/2$.
8. Be able to extract the frequency/period, amplitude and phase angle of a sine wave graph similar to the ones you are to draw in 6 and 7.
10. What property of a system (mass, compliance or resistance) is associated with the kinetic energy in vibratory motion?
11. What property of a system (mass, compliance or resistance) is associated with the potential energy in vibratory motion?
12. Does the transmitting medium for an acoustic wave have compliance? Explain.

13. What are the units of work or energy in MKS system?
14. Why would you not hear sound from a vibrating speaker in a vacuum?
15. How is pressure different than force?
16. Calculate the intensity ratio and the pressure ratio represented by 20 dB.
17. Calculate dB IL for a sound intensity of 2.8×10^{-4} watts/m².
18. Calculate dB SPL for a sound pressure of 8.5×10^5 μ Pa.
19. Calculate the pressure for sound at 18 dB SPL.
20. Calculate the pressure for a sound 26 dB SPL.
21. Calculate sound intensity in watts/m² if pressure is 40 μ Pa.
22. What are two reasons why we measure sound intensity in decibels? (2 points)
25. Which statement is true?
 - a. Intensity is directly proportional to the square root of pressure.
 - b. Intensity is directly proportional to the squared pressure.
 - c. Intensity is directly proportional to pressure.
 - d. None of the above describe the relationship between intensity and pressure.