Basic Acoustics
03:111
Due: Thursday, February 8, 2001

Name: _____
Section: _____

Questions for Chapter 2. Be sure to show your work and to label your units.

1. For each of the following *peak* sound pressure values, solve for the equivalent *rms* sound pressure.
   a. 2.0 Pa

   b. .5 Pa

2. For each of the following *rms* sound pressure values, solve for the equivalent *peak-to-peak* sound pressure.
   a. 1.5 Pa

   b. 0.707 Pa

3. Given a sinusoid with a maximum amplitude of 4 Pa, solve for each of the following:
   a. rms amplitude

   b. peak-to-peak amplitude

   c. FW_{avg} amplitude

   d. HW_{avg} amplitude

4. Calculate the frequency, in *Hz*, for each of the following periods:
   a. 0.003 s

   b. 5 ms

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c. 0.1 ms

d. 25 ms

e. 400 μs

5. Calculate period (T), in *ms*, for each frequency:
   a. 300 Hz

   b. 900 Hz

   c. 125 Hz

   d. 6000 Hz

6. Calculate frequency, in *kHz*, for each of the following
   a. 200 Hz

   b. 4 MHz

   c. 3000 Hz

7. Particle velocity leads particle displacement by _____ degrees.

8. Particle acceleration leads particle displacement by _____ degrees.

9. Instantaneous sound pressure and particle _____ are in phase.

10a. What are the two components of acoustic impedance?

b. Which of the two components is dependent on frequency?

c. Which of the two components dissipates energy?

11. When a system is vibrating at its natural frequency, what is the relationship between the mass reactance (X_m) and the compliant reactance (X_c).