

1. If a sound has an intensity of 10^{-5} watts/m² then how many decibels is it?
2. How long in meters is the music note that is A above middle C?
3. If lightning is seen 4 seconds prior to hearing its thunder, how many blocks away is it?
4. If a wave triples in amplitude, by what factor is its energy changed?
5. What is the frequency of the note that is one octave above the A that is used as the musical standard?
6. What is the period of a note that is 100 Hz?
7. If a wave has a wave length of 20 m then what is the wave number?
8. All senses respond as what function of the stimulation intensity?
9. The conservation of energy corresponds to which law of thermodynamics?
10. The best possible efficiency of a Carnot engine that runs between the temperatures of 300 and 750 degrees Kelvin is what value?
11. What is the specific heat at constant pressure for a diatomic gas as a factor of R?
12. What is the definition of the Boltzman constant?
13. How much work is done with a pressure of one atmosphere (be careful to use MKS units!) if the volume compresses from 4 to 3 cubic meters at constant pressure?
14. What is such a process called?
15. If the gain in heat is 3,000 J at a temperature that is standard for the earth, what is the change in entropy?
16. Entropy is the negative of what other variable?
17. How many moles does 50 grams of water correspond to?
18. The internal energy of an ideal gas is what factor times the average random kinetic energy?
19. The temperature of an ideal gas is what factor times the average random kinetic energy?
20. If a gas goes from a pressure of 4 atm to a pressure of 9 atm then what is the final volume if the original volume was 5 liters and the temperature is constant?
21. How many molecules are there in 4 moles of molecular nitrogen?