- F15. Our analysis for determining the speed of sound assumed that the sound wave had infinitesimal strength. But for the 120 dB sound waves produced by *Linkin Park* near the stage, this assumption may be suspect.
- a) One suitable definition of sound dB level is:

$$dB = 20 \log_{10} \left( \frac{\Delta p}{20 \times 10^{-6} \,\mathrm{Pa}} \right)$$

where  $\Delta p$  is a pressure variation caused by an average passing sound wave. Treating this sound wave as a shock wave, determine its propagation Mach number into still air. Hint: Put the propagating-shock situation into the shock's frame of reference.

b) Determine the temperature fluctuations associated with the passing waves. Would you say *Linkin Park* makes strong or wimpy shock waves?