Background

$$SPL = 20\log_{10}\left(\frac{P}{P_{ref}}\right)$$ Sound Pressure Level

$$P = P_{ref} \times 10^{\frac{SPL}{20}}$$ Sound Pressure or Reference Pressure

$$IL = 10\log_{10}\left(\frac{I}{I_0}\right)$$ Sound Intensity Level or Sound Intensity

$$I = \frac{P_{AV}}{4\pi r^2}$$ Intensity at a distance from point source

$$frequency = \frac{velocity}{wavelength}$$ Wave Velocity or Wave Length

Where

SPL = sound pressure level decibels (db)
P = sound wave pressure, newtons/meter2
Pref = reference pressure or hearing threshold, newton/meter2
IL = intensity level, decibel (db)
I = sound intensity, watt
I0= reference intensity or least audible sound level, watt
PAV = average power, watt
NPL = noise pollution level, decibel (db)

Notes:

- Usually, I0 is set to 10-12 watts
- Usually, Pref is set to 0.00002 newtons/meter2

References - Books:

1) P. Aarne Vesilind, J. Jeffrey Peirce and Ruth F. Weiner. 1994. Environmental Engineering. Butterworth Heinemann. 3rd ed.

2) Tipler, Paul A.. 1995. Physics For Scientists and Engineers. Worth Publishers. 3rd ed.