DECIBELS IN ACOUSTICS:

The decibel (dB) is used as a measure for sound levels. It is also a measurement unit in electronics, signals and communications.

The difference in intensity or 'loudness', L, between two sounds of intensity S_1 and S_2 is defined by the formula:

$$L = 10\log_{10}\left(\frac{S_2}{S_1}\right)$$

Similarly, the absolute measurement of the intensity or loudness of a sound, S, is given by:

$$L = 10\log_{10}\left(\frac{S}{S_0}\right)$$

where S_0 is a reference value and has a value of $0\,dB$

11.3 WORKED EXAMPLE

If the difference in intensity of two sounds is equal to 365 and the intensity of the softest sound detected by human ears is 32, what is the intensity of the other sound? Give your answer in scientific notation, correct to $3dp$.

11.4 WORKED EXAMPLE

How many times more intense is the sound of a heated argument (about 67 decibels) than the sound of a quiet room (about 31 decibels)?