dB and ratios, dBx, power, voltage, intensity, pressure

dB in acoustics is a ratio two quantities Given a system with an input signal of power Pin and output signal with power Pout then we express the ratio in dB as 10log(Pout/Pin) If the signals are given as voltages Vin and Vout, or pressures then the power ratio in dB is 20log(Vout/Vin) log here is log to the base 10

dBx represents a power P (in watts) of some signal relative to some reference power such as 1 watt or 1 milliwatt. dBW = 10log P, where P is in units of watts dBm = 10log P, where P is in units of milliwatts dB SPL = 20 log SPL/SPLref where SPLref = 20 uPa (threshold of hearing)

The table below can be read as (power ratio, dB), or (absolute power relative to ref, dBref)

power ratio X	X in dB=10log X	power ratio X	X in dB=10logX
0.000001	-60	1,000,000	60
0.00001	-50	100,000	50
0.0001	-40	10,000	40
0.001	-30	1,000	30
0.002	-27	500	27
0.005	-23	200	23
0.01	-20	100	20
0.0125	-19	80	19
0.02	-17	50	17
0.025	-16	40	16
0.033	-15	30	15
0.04	-14	25	14
0.05	-13	20	13
0.07	-12	15	12
0.08	-11	12	11
0.1	-10	10	10
0.125	-9	8	9
0.2	-7	5	7
0.25	-6	4	6
0.33	-5	3	5
0.4	-4	2.50	4
0.5	-3	2.00	3
0.7	-2	1.50	2
0.8	-1	1.25	1
1	0	1.00	0