



2^B

$$\frac{\text{max. value}}{\text{max error}} = 2^{-(B+1)}$$

$$\frac{\text{max. value}}{\text{max error}} = 2^B$$

$$\text{signal to noise ratio (dB)} = 20 * \log_{10} \left(\frac{2^{(B-1)}}{1/2} \right) = 20 * \log_{10} (2^B) = B * 20 \log_{10} (2)$$

	reference frequency					
relative frequency	1/4	1/2	1	2	4	
frequency	110	220	440	880	1760	amplitude
octaves	-2	-1	0	1	2	decades
half steps	-24	-12	0	12	24	decibels
						dB

$$\text{octaves} = \log_2 \left(\frac{f}{f_{\text{ref}}} \right)$$

relative frequency

$$\text{halfsteps} = 12 * \text{octaves} = 12 * \log_2 \left(\frac{f}{f_{\text{ref}}} \right)$$

$$\text{level-in-dB} = 20 * \log_{10} \left(\frac{a}{a_{\text{ref}}} \right)$$