

$\log_{10} 2 = 0.3$ の話

以下は常用対数の低10は省略

電力 (W) : $10 \log 2 = 3 \text{ dB} \Rightarrow 2$ 倍 (真数2) は3 dB

電圧 (V) : $20 \log 2 = 6 \text{ dB} \Rightarrow 2$ 倍 (真数2) は6 dB

$$\log (A \times B) = \log A + \log B$$

$$\log (A \div B) = \log A - \log B$$

以下は電力 (W) について

$$10 \text{ dB} \Rightarrow 10 \text{ 倍}$$

$$20 \text{ dB} \Rightarrow 100 \text{ 倍} \dots 20 = 2 \times 10 \log 10 = 10 \log 10^2 = 10 \log 100$$

$$30 \text{ dB} \Rightarrow 1000 \text{ 倍}$$

$$40 \text{ dB} \Rightarrow 10000 \text{ 倍}$$

$$50 \text{ dB} \Rightarrow 100000 \text{ 倍}$$

$$3 \text{ dB} \Rightarrow 2 \text{ 倍}$$

$$6 \text{ dB} \Rightarrow 4 \text{ 倍} \dots 10 \log 2 + 10 \log 2 = 10 \log (2 \times 2) = 10 \log 4$$

$$9 \text{ dB} \Rightarrow 8 \text{ 倍}$$

$$12 \text{ dB} \Rightarrow 16 \text{ 倍}$$

$$15 \text{ dB} \Rightarrow 32 \text{ 倍}$$

$$18 \text{ dB} \Rightarrow 64 \text{ 倍}$$

$$21 \text{ dB} \Rightarrow 128 \text{ 倍}$$

$$24 \text{ dB} \Rightarrow 256 \text{ 倍}$$

$$7 \text{ dB} = 10 \text{ dB} - 3 \text{ dB} = 10 \log 10 - 10 \log 2 = 10 \log (10 \div 2) \\ = 10 \log 5 \Rightarrow 5 \text{ 倍}$$

$$17 \text{ dB} = 20 \text{ dB} - 3 \text{ dB} \Rightarrow 10 \log 10^2 - 10 \log 2 = 10 \log (100 \div 2) \\ = 10 \log 50 \Rightarrow 50 \text{ 倍}$$

$$27 \text{ dB} = 30 \text{ dB} - 3 \text{ dB} \Rightarrow 10 \log 10^3 - 10 \log 2 = 10 \log (1000 \div 2) \\ = 10 \log 500 \Rightarrow 500 \text{ 倍}$$

$$37 \text{ dB} \Rightarrow 5000 \text{ 倍}$$

$$47 \text{ dB} \Rightarrow 50000 \text{ 倍}$$

$$-10 \text{ dB} \Rightarrow 1/10 \text{ 倍}$$

$$-20 \text{ dB} \Rightarrow 1/100 \text{ 倍}$$

$$-30 \text{ dB} \Rightarrow 1/1000 \text{ 倍}$$

$$-40 \text{ dB} \Rightarrow 1/10000 \text{ 倍}$$

$$-50 \text{ dB} \Rightarrow 1/100000 \text{ 倍}$$