Name

Logarithmic Scales - Magnitude to Measured Value (Number)

1

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12}W/m^2$$
$$\beta = 71dB$$

What is the sound intensity of a sound with a sound intensity of 71 dB on the decibel scale?

A $I = 1.26 \times 10^{-5}W/m^2$

B $I = 1.26 \times 10^{-7}W/m^2$

2

What is the hydrogen ion concentration of a solution with a pH of 9.7 on the pH scale?

$$pH = -\log[H^+]$$
$$pH = 9.7$$

A $[H^+] = 2 \times 10^{-10}mL/mol$

B $[H^+] = 6.31 \times 10^{-9}mL/mol$

3

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12}W/m^2$$
$$\beta = 112dB$$

What is the sound intensity of a sound with a sound intensity of 112 dB on the decibel scale?

A $I = 1.58W/m^2$

B $I = 0.158W/m^2$

4

What is the hydrogen ion concentration of a solution with a pH of 11.9 on the pH scale?

$$pH = -\log[H^+]$$
$$pH = 11.9$$

A $[H^+] = 3.98 \times 10^{-12}mL/mol$

B $[H^+] = 1.26 \times 10^{-12}mL/mol$

5

$$M = \log\left(\frac{I}{I_0}\right)$$
$$I_0 = 1\mu m$$
$$M = 4.5$$

What is the wave height of an earthquake with a magnitude of 4.5 on the Richter scale?

A $I = 31,623\mu m$

B $I = 3,162,278\mu m$

6

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12}W/m^2$$
$$\beta = 128dB$$

What is the sound intensity of a sound with a sound intensity of 128 dB on the decibel scale?

A $I = 6.31W/m^2$

B $I = 631W/m^2$

7

What is the hydrogen ion concentration of a solution with a pH of 13.8 on the pH scale?

$$pH = -\log[H^+]$$
$$pH = 13.8$$

A $[H^+] = 1.58 \times 10^{-14}mL/mol$

B $[H^+] = 1.58 \times 10^{-15}mL/mol$

8

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12}W/m^2$$
$$\beta = 95dB$$

What is the sound intensity of a sound with a sound intensity of 95 dB on the decibel scale?

A $I = 0.00316W/m^2$

B $I = 0.316W/m^2$