Name

Logarithmic Scales - Measured Value (Number) to Magnitude

1

$$pH = -\log[H^+]$$
$$[H^+] = 0.01 mL/mol$$

What is the pH on the pH scale when the hydrogen ion concentration is 0.01 mL/mol?

A $pH = 3.5$

B $pH = 2$

2

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12} W/m^2$$
$$I = 0.0001 W/m^2$$

What is the dB magnitude on the decibel scale when the sound energy is 0.0001 W/m^2?

A $\beta = 80 dB$

B $\beta = 87 dB$

3

$$M = \log\left(\frac{I}{I_0}\right)$$
$$I_0 = 1\mu m$$
$$I = 1 \times 10^9 \mu m$$

What is the magnitude on the Richter scale when the wave height is 1 x 10^9 micrometers?

A $M = 11$

B $M = 9$

4

$$pH = -\log[H^+]$$
$$[H^+] = 1 \times 10^{-6} mL/mol$$

What is the pH on the pH scale when the hydrogen ion concentration is 1 x 10^-6 mL/mol?

A $pH = 6$

B $pH = 8$

5

$$pH = -\log[H^+]$$
$$[H^+] = 1 \times 10^{-8} mL/mol$$

What is the pH on the pH scale when the hydrogen ion concentration is 1 x 10^-8 mL/mol?

A $pH = 6$

B $pH = 8$

6

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12} W/m^2$$
$$I = 1 \times 10^{-6} W/m^2$$

What is the dB magnitude on the decibel scale when the sound energy is 1 x 10^-6 W/m^2?

A $\beta = 67 dB$

B $\beta = 60 dB$

7

$$M = \log\left(\frac{I}{I_0}\right)$$
$$I_0 = 1\mu m$$
$$I = 100\mu m$$

What is the magnitude on the Richter scale when the wave height is 100 micrometers?

A $M = 2$

B $M = 1$

8

$$pH = -\log[H^+]$$
$$[H^+] = 1 \times 10^{-7} mL/mol$$

What is the pH on the pH scale when the hydrogen ion concentration is 1 x 10^-7 mL/mol?

A $pH = 7.5$

B $pH = 7$