mobius

Name ____________________

Logarithmic Scales - Ratio and Magnitude to Magnitude

1

$$pH = -\log{[H^+]}$$
$$\frac{[H^+]_2}{[H^+]_1} = 1,000,000$$
$$pH_1 = 9.9$$

If a solution has 1,000,000 times the Hydrogen ion concentration as one with a pH of 9.9 on the pH scale, what is it's pH?

A	B
$pH_2 = 3.9$	$pH_2 = 4.9$

2

$$pH = -\log{[H^+]}$$
$$\frac{[H^+]_2}{[H^+]_1} = 126$$
$$pH_1 = 5.3$$

If a solution has 126 times the Hydrogen ion concentration as one with a pH of 5.3 on the pH scale, what is it's pH?

A	B
$pH_2 = 3.2$	$pH_2 = 4.2$

3

$$dB = 10\log{(\frac{I}{I_0})}$$
$$\frac{I_2}{I_1} = 2,511,886$$
$$\beta_1 = 30dB$$

If a sound has 2,511,886 times the sound energy as one with a dB magnitude of 30 on the decibel scale, what is it's dB magnitude?

A	B
$\beta_2 = 95dB$	$\beta_2 = 94dB$

4

$$M = \log{(\frac{I}{I_0})}$$
$$\frac{I_2}{I_1} = 1.26$$
$$M_1 = 6.2$$

If an earthquake has 1.26 times the wave size as one with a magnitude of 6.2 on the Richter scale, what is it's magnitude?

A	B
$M_2 = 6.3$	$M_2 = 6.8$

5

$$pH = -\log{[H^+]}$$
$$\frac{[H^+]_2}{[H^+]_1} = 630,957$$
$$pH_1 = 8.2$$

If a solution has 630,957 times the Hydrogen ion concentration as one with a pH of 8.2 on the pH scale, what is it's pH?

A	B
$pH_2 = 3.9$	$pH_2 = 2.4$

6

$$dB = 10\log{(\frac{I}{I_0})}$$
$$\frac{I_2}{I_1} = 1.58$$
$$\beta_1 = 127dB$$

If a sound has 1.58 times the sound energy as one with a dB magnitude of 127 on the decibel scale, what is it's dB magnitude?

A	B
$\beta_2 = 129dB$	$\beta_2 = 135dB$

7

$$pH = -\log{[H^+]}$$
$$\frac{[H^+]_2}{[H^+]_1} = 199,526$$
$$pH_1 = 12.2$$

If a solution has 199,526 times the Hydrogen ion concentration as one with a pH of 12.2 on the pH scale, what is it's pH?

A	B
$pH_2 = 6.9$	$pH_2 = 8.9$

8

$$M = \log{(\frac{I}{I_0})}$$
$$\frac{I_2}{I_1} = 63.1$$
$$M_1 = 2.4$$

If an earthquake has 63.1 times the wave size as one with a magnitude of 2.4 on the Richter scale, what is it's magnitude?

A	B
$M_2 = 4.2$	$M_2 = 5.2$