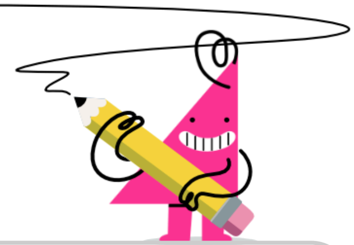
Name ______________________



Logarithmic Scales - Measured Value (Number) to Magnitude

1

$$M = \log\left(\frac{I}{I_0}\right)$$
$$I_0 = 1\mu m$$
$$I = 6.31 \times 10^9 \mu m$$

What is the magnitude on the Richter scale when the wave height is 6.31 x 10^9 micrometers?

A	B
$M = 8.8$	$M = 9.8$

2

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12} W/m^2$$
$$I = 3.16 \times 10^{-5} W/m^2$$

What is the dB magnitude on the decibel scale when the sound energy is 3.16 x 10^-5 W/m^2?

A	B
$\beta = 75dB$	$\beta = 72dB$

3

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12} W/m^2$$
$$I = 6.31 W/m^2$$

What is the dB magnitude on the decibel scale when the sound energy is 6.31 W/m^2?

A	B
$\beta = 124dB$	$\beta = 128dB$

4

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12} W/m^2$$
$$I = 3.98 W/m^2$$

What is the dB magnitude on the decibel scale when the sound energy is 3.98 W/m^2?

A	B
$\beta = 133dB$	$\beta = 126dB$

5

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

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

A	B
$\beta = 20dB$	$\beta = 26dB$

6

$$M = \log\left(\frac{I}{I_0}\right)$$
$$I_0 = 1\mu m$$
$$I = 20\mu m$$

What is the magnitude on the Richter scale when the wave height is 20 micrometers?

A	B
$M = 0.3$	$M = 1.3$

7

$$M = \log\left(\frac{I}{I_0}\right)$$
$$I_0 = 1\mu m$$
$$I = 3.16 \times 10^9 \mu m$$

What is the magnitude on the Richter scale when the wave height is 3.16 x 10^9 micrometers?

A	B
$M = 10$	$M = 9.5$

8

$$dB = 10\log\left(\frac{I}{I_0}\right)$$
$$I_0 = 10^{-12} W/m^2$$
$$I = 2 \times 10^{-5} W/m^2$$

What is the dB magnitude on the decibel scale when the sound energy is 2 x 10^-5 W/m^2?

A	B
$\beta = 73dB$	$\beta = 80dB$