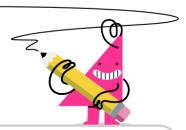


Logarithmic Scales - Magnitude Difference to Measured Value Ratio



$$M=\log(rac{1}{I_0})$$
 If an earthquake has a magnitude 0.1 higher on the Richter scale what is the ratio of their wave size measurements? $M_2-M_1=0.1$ $rac{A}{I_2}=39.8$ $rac{B}{I_2}=1.26$

2

$$\begin{aligned} M &= log\left(\frac{l}{l_0}\right) \\ M_2 - M_1 &= 0.1 \\ \hline \frac{l_2}{l_1} &= 39.8 \\ \hline \frac{l_2}{l_1} &= 1.26 \end{aligned} \\ M &= log\left(\frac{l}{l_0}\right) \\ M_2 - M_1 &= 39.8 \\ \hline \frac{l_2}{l_1} &= 1.26 \end{aligned} \\ M &= log\left(\frac{l}{l_0}\right) \\ M_2 - M_1 &= 3.2 \\ \hline \frac{l_2}{l_1} &= 1.585 \\ \hline \frac{l_2}{l_1} &= 15.8 \end{aligned}$$

3

$$M=\log{(rac{ extsf{I}}{ extsf{I}_0})}^{ ext{on the Richter scale what is the ratio of their wave size measurements?}} M_2-M_1=2.1rac{ ilde{ extsf{I}}_2}{ ilde{ extsf{I}}_1}=126rac{ ilde{ extsf{I}}_2}{ ilde{ extsf{I}}_1}=12,589$$

If an earthquake has a magnitude 2.1 higher on the Richter scale what is the ratio of their

If an earthquake has a magnitude 3.7 higher

on the Richter scale what is the ratio of their

If a sound has a dB magnitude 46 higher on the decibel scale what is the ratio of their

$$M = \log{(rac{1}{I_0})}$$
 $M_2 - M_1 = 3.1$
 $M_2 - M_1 = 3.1$
 $M_1 = M_1 = 3.1$
 $M_2 - M_1 = 3.1$
 $M_2 - M_1 = 3.1$

5

$$\mathsf{M} = \mathsf{log}\left(\frac{\mathsf{I}}{\mathsf{I}_0}\right)$$
 $\mathsf{M}_2 - \mathsf{M}_1 = 3.7 \frac{\mathsf{I}_2}{\mathsf{I}_1} = 501 \frac{\mathsf{B}}{\mathsf{I}_2} = 5,012$

$$\mathsf{M} = \mathsf{log}(\frac{\mathsf{I}}{\mathsf{I}_0})^{\frac{\mathsf{If an earthquake has a magnitude 7.3 higher on the Richter scale what is the ratio of their wave size measurements?}} \\ \mathsf{M}_2 - \mathsf{M}_1 = 7.3 \\ \frac{\mathsf{I}_2}{\mathsf{I}_1} = 2 \times 10^8 \\ \frac{\mathsf{I}_2}{\mathsf{I}_1} = 2 \times 10^7 \\ \frac{\mathsf{I}_2}{\mathsf{I}_1} = 2 \times 10^7 \\ \frac{\mathsf{I}_2}{\mathsf{I}_1} = 2 \times 10^7 \\ \frac{\mathsf{I}_3}{\mathsf{I}_2} = 2 \times 10^8 \\ \frac{\mathsf{I}_4}{\mathsf{I}_1} = 2 \times 10^7 \\ \frac{\mathsf{I}_5}{\mathsf{I}_1} = 2 \times 10^7 \\ \frac{\mathsf{$$

7

$$\mathsf{dB} = 10 \log \left(\frac{\mathsf{I}}{\mathsf{I}_0}\right)^{\frac{\mathsf{sound energy measurements?}}{\mathsf{A}}} \mathsf{dB} = 10 \log \left(\frac{\mathsf{I}}{\mathsf{I}_0}\right)^{\frac{\mathsf{the decibel scale what is the ratio of their sound energy measurements?}}{\mathsf{B}} \mathsf{dB} = 10 \log \left(\frac{\mathsf{I}}{\mathsf{I}_0}\right)^{\frac{\mathsf{I}_0}{\mathsf{I}_0}} \mathsf{dB} = 10 \log \left(\frac{\mathsf{I}_0}{\mathsf{I}_0}\right)^{\frac{\mathsf{I}_0}{\mathsf{I}_0}} \mathsf{dB} = 10 \log \left(\frac{\mathsf{I}_0}{\mathsf{I}_0}\right)^{\frac{\mathsf{I}_0}{\mathsf{I}_0}$$

$$eta_2 - eta_1 = 27$$

If a sound has a dB magnitude 27 higher on the decibel scale what is the ratio of their

$$egin{aligned} egin{aligned} ar{f l}_2^{f a} &= {f 501} ar{f l}_2^{f B} &= {f 2}, {f 512} \end{aligned}$$

8