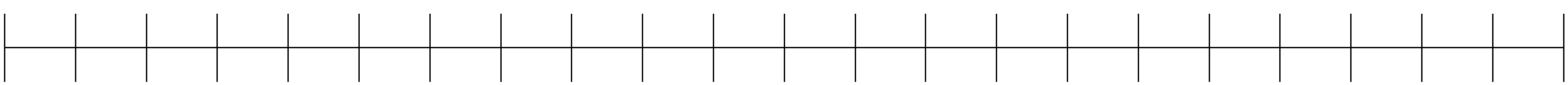
Lv 4: Logarithmic Electromagnetic Spectrum Diagram Name ___________________________

The following table indicates (roughly) the frequency range of each type of electromagnetic wave.
Determine the logarithm in base 10 of the lowest and highest frequency in each range.

Type of Wave	**Lowest Frequency**	**Highest Frequency**	**Log of lowest Frequency:**	**Log of highest Frequency**
Radio Wave	3.00 Hz	3.00 x 10^{8} Hz		
Microwave	3.00 x 10^{8}	3.00 x 10^{11} Hz		
Infrared	3.00 x 10^{11} Hz	3.00 x 10^{14} Hz		
Visible Light / Ultraviolet	3.00 x 10^{14} Hz	3.00 x 10^{16} Hz		
X-Ray	3.00 x 10^{16} Hz	3.00 x 10 ^{18} Hz		
Gamma Ray	3.00 x 10 ^{18} Hz	3.00 x 10^{20} Hz		

The graph below shows an axis labeled $\log_{10}\left(\frac{\nu}{\text{Hertz}}\right)$. On this axis, label the hash marks with appropriate values. Then, indicate the range occupied by each type of electromagnetic wave. AND DON'T SKIP THE BACK!



$$\log_{10}\left(\frac{\nu}{\text{Hertz}}\right)$$

now……DON'T SKIP THE BACK!

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In about 3 -4 sentences, explain why this axis is very useful with a *logarithmic scale*, and why, if it had a linear scale, it would have failed.

A perfect score answer will do each of the following:
- explain why a linear scale would NOT successfully depict each type of electromagnetic wave
- explain why the logarithmic scale DOES successfully depict each type of electromagnetic wave
- refer to specific examples of waves to answer this question
- refer to specific numerical **ranges** of frequency to answer this question

What famous TV theme song begins
“Who can turn the world on with her smile?”