KILROY ACADEMY

NAME: _____ DATE: _____

A MARINE SCIENTIST'S GUIDE TO LOGARITHMS

Complete the following as you watch the video *A Marine Scientist's Guide to Logarithms*.

1. Marine scientists plot the change in pressure with depth on a _____ scale, while the change in light with depth is plotted on a _____ scale.

2. Describe how pressure changes with depth.

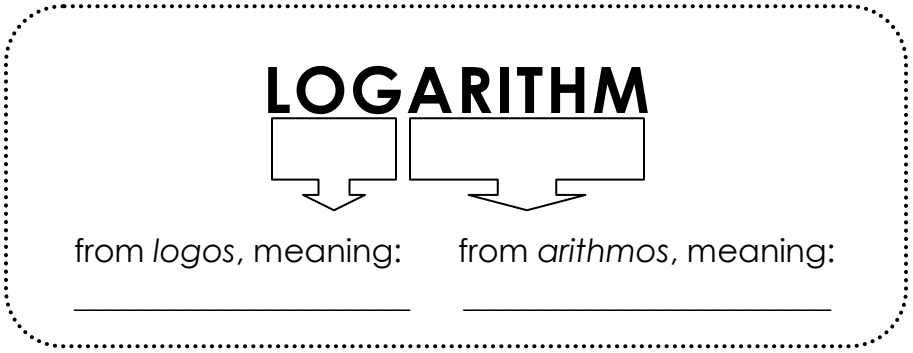
3. What type of function is created when graphing pressure versus depth?

4. Pressure changes with depth by _____.

5. Explain several factors that cause light to decrease with depth.

6. Light changes with depth by _____.

7. Since light decreases with depth rapidly, the numbers get very small very fast. This makes them difficult to write and to plot in a meaningful way. This is why we use _____.



8. A logarithm is literally a _____ _____.

9. The common base for logarithms (and scientific notation) is _____.

10. Positive exponents represent _____ numbers, negative exponents represent _____ numbers, and any number to the power of zero is always _____.

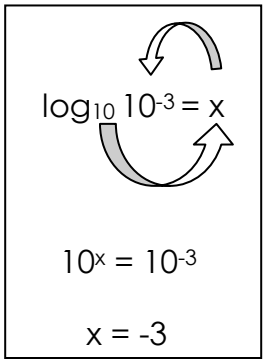
11. Logarithms are to _____, as subtraction is to addition, or as division is to multiplication; think of a logarithm as the _____ of an exponent.

12. Remember this! Write the definition of a logarithm.

13. Logarithmic scales use intervals that correspond to _____ of _____; steps increase by multiplication.

14. Why do marine scientists plot the change in pressure with depth on a linear scale, while they plot the change in light with depth on a log scale?

Let's try a few examples. Evaluate the following logarithms by using the definition to rewrite in exponential form.



$\log_{10} 1{,}000{,}000 = x$ $\log_{10} \frac{1}{10^7} = x$ $\log 10 = x$

Now you try! Evaluate the following logarithms by using the definition to rewrite in exponential form.

1. $\log_{10} \frac{1}{10} = x$

2. $\log_{10} 10^4 = x$

3. $\log \frac{1}{1{,}000{,}000{,}000} = x$

4. $\log 10{,}000 = x$

5. $\log_{10} \frac{1}{1000} = x$

6. $\log 10^{-35} = x$

7. Think! Explain what you think would happen if you changed the base from 10 to another number, such as 2.

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