Math 3 **3.1 Intro to Logarithms** Unit 3

*EQ: How do you simplify and solve simple logarithm equations?*



A logarithm is just a special way to ask a specific question.

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**THE QUESTION:**  What **exponent** is required to go from a **base “b”** to reach a value of **“a”**?

Note: if a log has no base written, it is implied that the base is \_\_\_\_\_\_\_.

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| **Exponential Form** | **Logarithmic Form** |
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| Example: | Example: |

**SWOOSH Method**

Used to convert between exponential form and logarithmic form (and vice versa)!

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| **Logarithmic Form:** |  |  |  |  |  |  |
| **Exponential Form:** |  |  |  |  |  |  |



**Evaluating Logarithms**

Used when evaluating a logarithm that is not already in base 10. Be sure to write each out, and then evaluate using your calculator and the LOG button!

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| --- | --- | --- | --- | --- | --- | --- |
| **Example:** |  |  |  |  |  |  |
| **Solution:** |  |  |  |  |  |  |

**Solving using Simple Logarithms**

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| **SWOOSH Method** | | **Evaluating** | **Log = Log** |
| Log#(x) = # | bx = # | Log#(#) = x | Log(x) = Log(x) |
| Use when a variable is attached to the logarithm. | Use when a base is raised to an unknown and equals a number. | Use when a constant is attached to the logarithm | Use when one log is = to one other log. Logs must have the same base in order to cancel. |

**Example 1:** Solve each of the following for x.

1. Log2(2x + 1) = 4
2. Log5125 = x2 – 2x
3. 5x - 2 = 32
4. Log4(17x – 4) = 3
5. 3x + 6 = 12
6. Log216 = x2
7. 2(4)x = 14
8. Log(2x – 5) = 2
9. Log510 = x + 6

**Example 2:** Solve by canceling the logs!

1. 
2. **