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Unit 12: Logarithms properties

Reminder:

$$y = \log_a(x) \quad \text{<===>} \quad a^y = x$$

Example:

In words:

■ $= \log_a(x)$: What number do I need to use as exponent such that $a^{\blacksquare} = x$?

Warm-up

1. $16 = 2^x$	**2.** $256 = 2^x$	**3.** $2048 = 2^x$
4. $\mathrm{x} = \log_2 64$	**5.** $\mathrm{x} = \log_2 128$	**6.** $\mathrm{x} = \log_2 256$
7. $\mathrm{x} = \log_2 16$	**8.** $\mathrm{x} = \log_4 16$	**9.** $\mathrm{x} = \log_{16} 16$
10. $\mathrm{x} = \log_3\left(\frac{1}{9}\right)$	**11.** $\mathrm{x} = \log_9\left(\frac{1}{9}\right)$	**12.** $\mathrm{x} = \log_{10}(10^7)$

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From the definitions:

$$a^{\log_a(x)} = \_\_\_\_\_$$

$$\log_a(a^x) = \_\_\_\_\_$$

Product theorem (12-4)

$$\log_a(x \cdot y) = \_\_\_\_\_$$

(proof on the board. You can copy here, OR put in some examples)

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Division theorem (12-6)

$$\log_a\left(\frac{x}{y}\right) = \_\_\_\_\_$$

(proof on the board. You can copy here, OR put in some examples)

Power theorem (12-5)

$$\log_a(x^p) = \_\_\_\_\_$$

(proof on the board. You can copy here, OR put in some examples)