

# Common Logarithm

- A common logarithm is a logarithm that is base 10.
- When a logarithm is base 10, we don't write the base.  **$\log_{10} = \log$**
- We like base 10 because we can evaluate it in our calculator. (Use the LOG button.)

# Evaluate with a calculator

$$21) \log_{10} 10 = 1$$

$$22) 2 \log_{10} 2.5 = 0.7959$$

$$23) \log_{10} (-2) \text{ *no solution*}$$

Remember this means  $10^? = -2$

# Properties of Logarithms

$$\text{A.) } \log_a 1 = 0$$

because  $a^0 = 1$

$$\text{B.) } \log_a a = 1$$

because  $a^1 = a$

$$\text{C.) } \log_a a^x = x$$

$$a^{\log_a x} = x$$

# Simplify

$$11) \log_8 8 = 1$$

$$12) \log_3 3^4 = 4$$

$$13) \log_{10} 10^2 = 2$$

$$14) 3^{\log_3 x} = x$$

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# More Properties of Logarithms

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$$\text{If } \log_a x = \log_a y$$

$$\text{then } x = y$$