Logarithm (4A)

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Radical & Logarithmic Functions (1)

$$3^2 = 9$$

exponent

$$\sqrt[2]{9} = x \qquad 9 = x^2$$

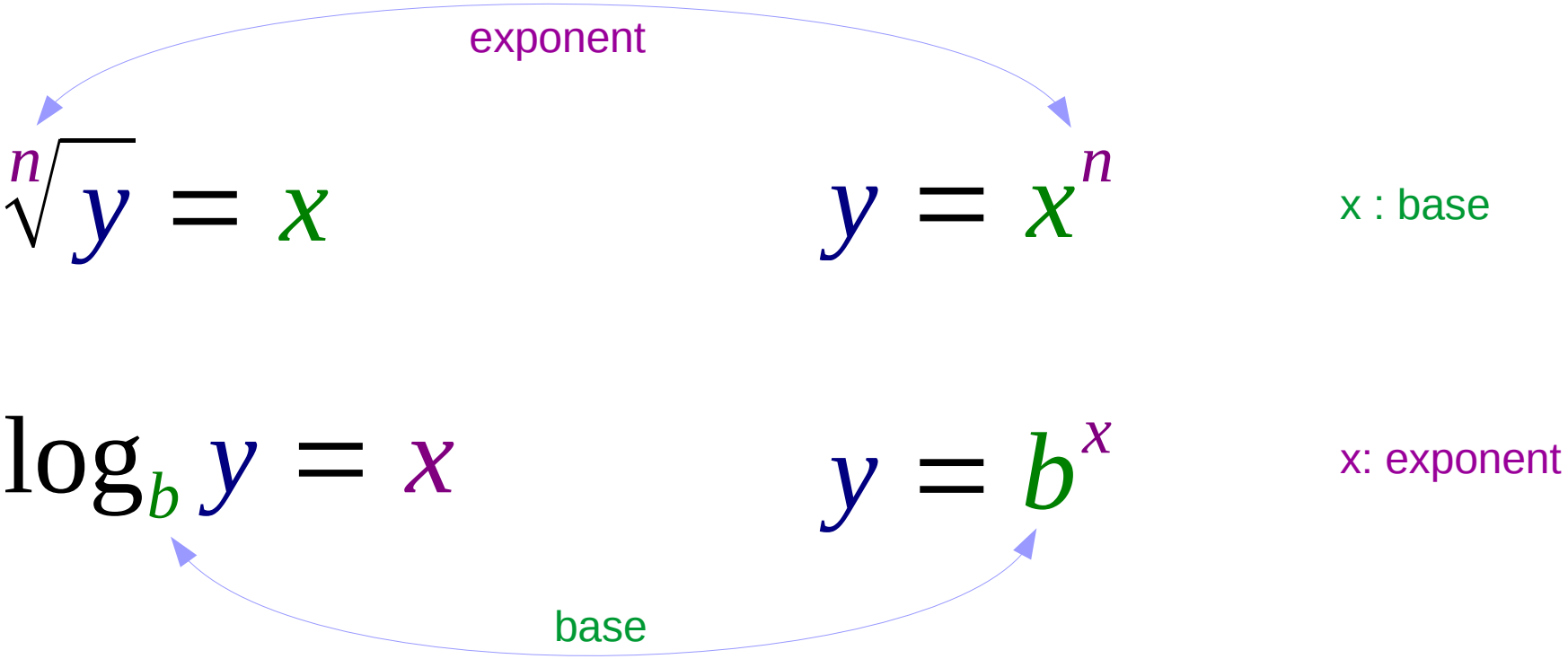
x : base

$$\log_3 9 = x \qquad 9 = 3^x$$

x: exponent

base

Radical & Logarithmic Functions (2)



Exponential & Logarithmic Functions

$$\log_b y = x \quad \equiv \quad y = b^x$$

$$\log_b x = y \quad \equiv \quad x = b^y$$

x: exponent

Inverse Function Relationship

$$\log_b y = x \quad \equiv \quad y = b^x$$

$$\log_b x = y \quad \equiv \quad x = b^y$$

Properties

$$b^{\log_b x} = y$$

$$\log_b y = \log_b x$$

$$\log_b b^x = y$$

$$b^y = b^x$$

$$b^{\log_b x} = y \quad \Rightarrow \quad x$$

$$\log_b y = \log_b x \quad \Leftrightarrow \quad y = x$$

$$\log_b b^x = y \quad \Rightarrow \quad x$$

$$b^y = b^x \quad \Leftrightarrow \quad y = x$$

Properties

$\log_b x$ *The exponent that must be raised to the base **b** to get **x***

$b^{\log_b x}$ *If the base **b** is raised to the power which must be raised to the base **b** to get **x***

$$\log_b x = y \quad \Leftrightarrow \quad x = b^y$$

$$b^{\log_b x} = b^y \quad \Rightarrow \quad x$$

$$\log_b b^x = y \quad \Leftrightarrow \quad b^y = b^x$$

$$\log_b b^x = y \quad \Rightarrow \quad x$$

References

[1] http://en.wikipedia.org/
[2] http://planetmath.org/
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[4] Smith, R. T., Minton, R. B. “Calculus: Concepts & Connections,” Mc Graw Hill
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