

# Laws of Exponents



# Preliminaries and Objectives

## Preliminaries

- The notation of exponents

## Objectives

- Laws of Exponents

# Positive Exponents

$$(10)(10)(10)(10)(10)(10)(10) = 10^7$$

# Negative Exponents

$$10^4 = 10 \cdot 10 \cdot 10 \cdot 10 = 10,000$$

$$10^3 = 10 \cdot 10 \cdot 10 = 1000$$

$$10^2 = 10 \cdot 10 = 100$$

$$10^1 = 10 = 10$$

$$10^0 = 1$$

$$10^{-1} = \frac{1}{10} = \frac{1}{10^1}$$

$$10^{-2} = \frac{1}{100} = \frac{1}{10^2}$$

# Multiplication = Adding Exponents

$$(b^3) (b^4)$$

$$(b \cdot b \cdot b) \cdot (b \cdot b \cdot b \cdot b) = b^7$$

$$b^3 \cdot b^4 = b^{3+4} = b^7$$

# Division = Subtracting Exponents

$$\frac{b^2}{b^6} = \frac{b \cdot b}{b \cdot b \cdot b \cdot b \cdot b \cdot b}$$

$$= \frac{1}{b \cdot b \cdot b \cdot b} = \frac{1}{b^4}$$

$$= b^{-4}$$

# Recap

$$b^1 = b$$

$$b^0 = 1$$

$$b^{-x} = \frac{1}{b^x}$$

$$b^x \cdot b^y = b^{x+y}$$

$$\frac{b^x}{b^y} = b^{x-y}$$

$$(b^x)^y = b^{x \cdot y}$$