

# Exponent Rules

## Multiplying

- Base numbers *must* be the same!
- Add the exponents.

### Examples

$$\begin{aligned} 1. 10^2 \times 10^4 &= \underline{10^6} = (10 \cdot 10)(10 \cdot 10 \cdot 10 \cdot 10) \\ 2. b^3 \cdot b^5 &= \underline{b^8} = (b \cdot b \cdot b)(b \cdot b \cdot b \cdot b \cdot b) \end{aligned}$$

## Dividing

- Base numbers *must* be the same!
- Subtract the exponents.

### Examples

$$\begin{aligned} 1. 5^4 \div 5^2 &= \underline{5^2} = \frac{5 \cdot 5 \cdot 5 \cdot 5}{5 \cdot 5} \\ 2. a^3 \div a^2 &= \underline{a} = \frac{a \cdot a \cdot a}{a \cdot a} \end{aligned}$$

## Powers

- When an exponent is raised to another exponent.
- Multiply the exponents.

### Examples

$$\begin{aligned} 1. (10^3)^4 &= \underline{10^{12}} = (10 \cdot 10 \cdot 10)(10 \cdot 10 \cdot 10)(10 \cdot 10 \cdot 10) \\ 2. (b^2)^5 &= \underline{b^{10}} = (b \cdot b)(b \cdot b)(b \cdot b)(b \cdot b)(b \cdot b) \end{aligned}$$