

Laws of Exponents

ER5

Quotient of Powers Property: (dividing)

$$\frac{a^b}{a^c} = a^{b-c}$$

$$\frac{2^5}{2^3} = 2^2$$

when dividing and the bases are same, subtract the exponents

proof:

$$\frac{2^5}{2^3} = \frac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 2} = 2^2 \quad \text{④}$$

Power of a Quotient Property:

$$\left(\frac{a}{b}\right)^2 = \frac{a^2}{b^2}$$

ex: $\frac{12^4}{4^4} = 3^4$

when dividing and the exponents are same, divide the bases

proof:

Example:

$$\frac{12^4}{4^4} = \frac{12 \cdot 12 \cdot 12 \cdot 12}{4 \cdot 4 \cdot 4 \cdot 4} = 3 \cdot 3 \cdot 3 \cdot 3 = 3^4 = 81$$

$12 \div 4 = 3$