

Exponent Rules

The small raised number tells how many times to multiply the base

$$3^4$$

3 = base (the number being multiplied)

4 = exponent (how many 3s to multiply)

$$3 \times 3 \times 3 \times 3 = 81$$

Three main rules

Multiply same bases

1. Keep x. 2. Add the exponents: $3 + 4 = 7$.

$$x^3 \cdot x^4$$

Answer: x^7

Divide same bases

1. Keep a. 2. Subtract the exponents: $8 - 3 = 5$.

$$a^8 / a^3$$

Answer: a^5

Power raised to a power

1. Keep m. 2. Multiply the exponents: $2 \cdot 5 = 10$.

$$(m^2)^5$$

Answer: m^{10}

Power outside parentheses

Give the outside exponent to every part inside.

$$(2x)^3$$
$$2^3 \cdot x^3$$

Answer: $8x^3$

Exponent Rules

Zero exponents and guided practice

Zero exponent

Any nonzero base with an exponent of 0 equals 1.

$$7^0 = 1$$

Remember the hidden 1

A letter without a written exponent has an exponent of 1.

$$x = x^1$$
$$x^5 \cdot x = x^6$$

Negative exponent

Move the power across the fraction bar. The exponent becomes positive.

$$x^{-3} = 1/x^3$$
$$2^{-3} = 1/2^3 = 1/8$$

Try these

1. $x^3 \cdot x^4 =$	2. $a^8 / a^3 =$
3. $(m^2)^5 =$	4. $b^6 \cdot b^2 =$
5. $y^9 / y^4 =$	6. $(p^3)^2 =$
7. $7^0 =$	8. $(2x)^3 =$
9. $c^5 \cdot c =$	10. $d^7 / d^7 =$

Answers: 1. x^7 | 2. a^5 | 3. m^{10} | 4. b^8 | 5. y^5 | 6. p^6 | 7. 1 | 8. $8x^3$ | 9. c^6 | 10. 1