



Exponent Rules

KEY IDEA

When multiplying powers with the same base, add the exponents: $x^a \cdot x^b = x^{a+b}$. When dividing, subtract the exponents: $x^a \div x^b = x^{a-b}$. When raising a power to a power, multiply the exponents: $(x^a)^b = x^{ab}$. Numeric coefficients follow ordinary arithmetic, separately from the exponent rule.

How to do it

1. Multiply or divide the numeric coefficients on their own, using ordinary arithmetic.
2. For the variable part, apply the matching rule: add exponents when multiplying, subtract when dividing, multiply when raising a power to a power.
3. Write the base only once in the final answer, with the combined exponent.
4. Double-check that every factor in the original problem is accounted for in the result.

Worked examples

Example 1. $(2x^5)^6$

$$64x^{30}$$

Example 2. $(4x^2)(4x^2)$

$$16x^4$$

Example 3. $(5x^4)(5x^6)$

$$25x^{10}$$

Example 4. $(28x^4) \div (4x^3)$

$$7x^1$$





Exponent Rules

Directions: Simplify using the laws of exponents.

1. $(8x^5)^3$	2. $(2x^6)(8x^2)$	3. $(9x^5)^4$
4. $(3x^5)(7x^3)$	5. $(9x^5)^2$	6. $(4x^2)^3$
7. $(7x^5)^4$	8. $(8x^5)(2x^4)$	9. $(6x^6)^3$
10. $(6x^4)^2$	11. $(6x^5)(6x^5)$	12. $(5x^3)^3$
13. $(7x^2)^4$	14. $(6x^4)(7x^2)$	15. $(4x^2)(9x^3)$
16. $(4x^3)^3$	17. $(2x^2)^2$	18. $(7x^6)(9x^4)$
19. $(7x^5)(4x^2)$	20. $(32x^6) \div (4x^3)$	21. $(25x^6) \div (5x^4)$
22. $(9x^5)(2x^4)$	23. $(4x^3)^5$	24. $(30x^5) \div (5x^4)$
25. $(9x^2)(3x^4)$	26. $(3x^2)^2$	27. $(72x^3) \div (8x^2)$
28. $(63x^6) \div (7x^5)$	29. $(30x^4) \div (5x^2)$	30. $(8x^5)^4$

