

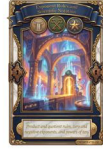
Exponent Rules and Scientific Notation

Product and quotient rules, zero and negative exponents, and powers of ten.

Name _____ Date _____

32 main 2-up grid 2 pages

Completion Reward



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1. Which expression is equivalent to $x^3 \cdot x^5$?

- A. x^{15}
- B. x^8
- C. $2x^8$
- D. x^2

2. Which expression is equivalent to $5y^7 / y^2$?

- A. $5y^{19}$
- B. $5y^3$
- C. y^5
- D. $5y^5$

3. What is $7r^0$ equal to?

- A. 0
- B. 7
- C. r
- D. $7r$

4. What does 10^3 mean?

- A. 300
- B. 30
- C. 1000
- D. 10^3 means 10 times 3

5. What is n^0 when n is nonzero?

- A. 0
- B. 1
- C. n
- D. -1

6. Write 6.3×10^4 as a standard number. Answer with a number.

7. Write 4,500,000 in scientific notation. What coefficient should appear before $x \times 10^n$? Answer with a number.

8. A student says $x^2 + x^3 = x^5$. What is the mistake?

- A. The exponents should be multiplied to get x^6 .
- B. You should subtract the exponents to get x .
- C. Exponents add when powers are multiplied, not when separate terms are added.
- D. The expression should simplify to $2x^5$.

9. Which expression is equivalent to n^{-3} ?

- A. $-n^3$
- B. n^3
- C. $1 / n^3$
- D. $1 / 3n$

10. Which number is written in correct scientific notation?

- A. 41×10^5
- B. 0.41×10^7
- C. 4.1×10^6
- D. 4.1×6^{10}

11. Write 7.2×10^{-3} as a decimal. Answer with a number.

12. Which expression is equivalent to 0.00052?

- A. 5.2×10^{-4}
- B. 5.2×10^4
- C. 52×10^{-5}
- D. 0.52×10^{-3}

13. Which expression is equivalent to $1 / k^4$?

- A. $-k^4$
- B. k^4
- C. k^{-4}
- D. $1 / 4k$

14. What is the best next step to simplify $(12y^5) / (3y^2)$?

- A. Divide the coefficients and subtract the exponents on y
- B. Add the coefficients and subtract the exponents on y
- C. Multiply everything by y^2 first
- D. Change y^5 / y^2 into y^7

15. What is the best next step to simplify $(2a^3)(3a^2)$?

- A. Add the coefficients and multiply the exponents.
- B. Subtract the exponents because the bases match.
- C. Multiply the coefficients and add the exponents on a .
- D. Distribute $2a^3$ across 3 and a^2 .

16. A student says $z^6 / z^2 = z^3$. What is the mistake?

- A. They should add the exponents to get z^8 .
- B. They should multiply the exponents to get z^{12} .
- C. They should subtract exponents: $6 - 2 = 4$, not divide the exponents.
- D. They forgot to change z into $1/z$.

17. A student says $x^{-2} = -x^2$. What is the mistake?

- A. A negative exponent means reciprocal, not a negative sign in front.
- B. They should add 2 to the exponent instead.
- C. They should square first and then negate.
- D. Negative exponents always equal 0.

18. A student says $(x^2)^3 = x^5$. What is the mistake?

- A. They should subtract the exponents to get x^{-1} .
- B. They should distribute the 3 only to the coefficient.
- C. They should multiply the exponents, not add them.
- D. The expression should stay as x^{2^3} .

19. Simplify $(m^4)(m^2)$. Answer with your final expression.

20. Simplify $(p^3)^4$. Answer with your final expression.

21. Simplify a^9 / a^4 . Answer with your final expression.

22. Simplify $(4x^2)(5x^3)$. Answer with your final expression.
23. Simplify $(2m^2)^3$. Answer with your final expression.
24. Simplify $(12y^5) / (3y^2)$. Answer with your final expression.
25. Rewrite $1 / p^3$ using a negative exponent. Answer as an expression.
26. Write 0.00081 in scientific notation. Answer in scientific notation.
27. Which expression is equivalent to $(2 \times 10^3)(3 \times 10^2)$?
- A. 5×10^6
B. 6×10^6
C. 6×10^1
D. 6×10^5
28. Which expression is equivalent to $(8 \times 10^6) / (2 \times 10^2)$?
- A. 4×10^8
B. 4×10^4
C. 6×10^4
D. 4×10^3
29. Which student rewrote 52×10^4 correctly in normalized scientific notation?
- A. Student B: 5.2×10^4
B. Student C: 52×10^5
C. Student D: 0.52×10^6
D. Student A: 5.2×10^5
30. Simplify $(r^6 \cdot r^2) / r^3$. Answer with your final expression.
31. Simplify $3x^2 \cdot x^4$. Answer with your final expression.
32. Which student work is valid?
- A. Student B: $a^4 + a^2 = a^6$ because the bases match and the exponents add.
B. Student C: $(a^4)^2 = a^6$ because $4 + 2 = 6$.
C. Student A: $a^4 \cdot a^2 = a^6$ because the bases match and the exponents add.
D. Student D: $a^4 / a^2 = a^2 / a^4$ because quotient means flip both powers.