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

Shown here as a small pack artifact, not a preview destination.

1. Which expression is equivalent to x^3 * 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^9
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 x 10^4 as a standard number. Answer with a number.

7. Write 4,500,000 in scientific notation. What coefficient should appear before x 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 x 10^5
B. 0.41 x 10^7
C. 4.1 x 10^6
D. 4.1 x 6^10

11. Write 7.2 x 10^-3 as a decimal. Answer with a number.

12. Which expression is equivalent to 0.00052?

A. 5.2 x 10^-4
B. 5.2 x 10^4
C. 52 x 10^-5
D. 0.52 x 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 x 10^3)(3 x 10^2)?**

A. 5 x 10^6
B. 6 x 10^6
C. 6 x 10^1
D. 6 x 10^5

28. **Which expression is equivalent to (8 x 10^6) / (2 x 10^2)?**

A. 4 x 10^8
B. 4 x 10^4
C. 6 x 10^4
D. 4 x 10^3

29. **Which student rewrote 52 x 10^4 correctly in normalized scientific notation?**

A. Student B: 5.2 x 10^4
B. Student C: 52 x 10^5
C. Student D: 0.52 x 10^6
D. Student A: 5.2 x 10^5

30. **Simplify (r^6 * r^2) / r^3. Answer with your final expression.**

31. **Simplify 3x^2 * 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 * 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.