

Exponentials

Product Rule: $A^m \times A^n = A^{m+n}$

Quotient Rule: $A^m \div A^n = A^{m-n}$

Zero Power Rule: $A^0 = 1, A \neq 0$

Power Rule: $(A^m)^n = A^{mn}$

Negative Power Rule: $A^{-m} = \frac{1}{A^m}$

Simplify the following expressions in exponential notation.

1. $3^5 \times 3^3 \div 3^6$

2. $12^0 \times 12^4$

3. $(7^2)^{-11}$

4. $\frac{5^{-4}}{5^8}$

5. $(4^9 6^7)^3$

6. $\frac{8^9 \times 8^2 \times 8^7}{8}$

7. $\frac{9 \times 9 \times 9 \times 9}{9^4}$

8. $\frac{(2^{10})^2 2^3}{2^9}$

9. $11^4 \times 3^7 \div 3^3$

10. $13^5 \div (13^6 \times 13^2)$

11. $\frac{5^8}{7^{-3} 7^7}$

12. $\frac{6^0}{6^{14}}$

13. $10^7 \times \frac{1}{10^5}$

14. $\frac{4^{12} \times 9^4 \times 9^6}{9^8 \times 4^{-3}}$

15. $(2^{10} \times 5^{-7} \times 2^3)^2$