

Multiplying Exponentials

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

When you multiply exponentials with the SAME base, you add the exponents

Example: Simplify $7^3 \times 7^8$ in exponential notation.

$$\begin{aligned}7^3 \times 7^8 &= 7^{3+8}, \\ &= 7^{11}.\end{aligned}$$

Simplify the following expressions in exponential notation.

1. $6^7 \times 6^4$

2. $9 \times 9 \times 9 \times 9 \times 9$

3. $4^5 \times 4 \times 4^8$

4. $12^6 \times 12^9 \times 12^3 \times 12^2$

5. $2^2 \times 8$

6. $3^{79} \times 3^{11}$

7. $5^7 \times 5^2 \times 5^3$

8. $11^4 \times 11^4 \times 11^4 \times 11^4$

9. $49 \times 7^3 \times 7$

10. $8^{33} \times 8^5$

11. $5 \times 5^3 \times 125$

12. $10^8 \times 10^5 \times 10 \times 10^2$

13. $2^4 \times 5^2 \times 2^7 \times 5^3$

14. $7^3 \times 2^4 \times 7^5 \times 2^2$

15. $3^4 \times 5^4 \times 3^2 \times 5^3$

16. $4^3 \times 10^3 \times 4 \times 10^2$

N.B. If a number does not have an exponent, it's understood to be 1!

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Simplify the following expressions in exponential notation.

1. $12^8 \times 12^3$

2. $12^7 \times 12^5 \times 12^8 \times 12^3$

3. $8^8 \times 8^6 \times 8^3$

4. $11^6 \times 11^2 \times 11^5 \times 11^5$

5. $2^6 \times 2^9$

6. $2^3 \times 2^6$

7. $4^3 \times 4^6$

8. $11^3 \times 11^4$

9. $5^6 \times 5^3$

10. $4^2 \times 4^3 \times 4^2$

11. $11^6 \times 11^4 \times 11^9 \times 11^9$

12. $5^5 \times 5^4 \times 5^8 \times 5^8$

13. $6^5 \times 6^6$

14. $11^6 \times 11^5 \times 11^8 \times 11^7$

15. $5^8 \times 5^9$

16. $y^5 \times y^7 \times y^5$

17. $t^5 \times t^5$

18. $m^8 \times m^9 \times m^6 \times m^3$

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Simplify the following expressions in exponential notation.

1. $11^5 \times 11^3$

2. $5^2 \times 5^5 \times 5^6 \times 5^5$

3. $7^8 \times 7^9$

4. $7^7 \times 7^5$

5. $4^4 \times 4^8 \times 4^6 \times 4^9$

6. $10^6 \times 10 \times 10^7 \times 10^4$

7. $12^9 \times 12 \times 12^3$

8. $11^5 \times 11^7 \times 11^6 \times 11^5$

9. $5^5 \times 5^8 \times 5^2$

10. $7^3 \times 7^4 \times 7^3 \times 7^7$

11. $12^3 \times 12^2 \times 12^3$

12. $9^2 \times 9 \times 9^5 \times 9^9$

13. $12^3 \times 12^6$

14. $12^5 \times 12^3 \times 12^9$

15. $8^8 \times 8^6$

16. $a^6 \times a^3 \times a^3$

17. $b^6 \times b^3$

18. $d^9 \times d^2 \times d^3$

19. $y^35^2y2^45^3$

20. $X^4y^4xy^5$

21. $X^5y^3z^4xy^5z^2$

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Simplify the following expressions in exponential notation.

1. $6^2 \times 6^3$

2. $5^7 \times 5 \times 5^8 \times 5^4$

3. $5^9 \times 5^4$

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

5. $8^2 \times 8^2 \times 8^2$

6. $11^5 \times 11^9$

7. $8^2 \times 8^8 \times 8^3 \times 8^2$

8. $5^7 \times 5^8 \times 5^3 \times 5^9$

9. $11^8 \times 11^9$

10. $5^4 \times 5 \times 5^2 \times 5^4$

11. $12^4 \times 12^8 \times 12^3$

12. $2^6 \times 2^8 \times 2^7 \times 2^4$

13. $7^3 \times 7^6$

14. $3^5 \times 3^9 \times 3 \times 3^4$

15. $7^8 \times 7^5 \times 7^4 \times 7^7$

16. $n^7 \times n^3$

17. $p^9 \times p^2$

18. $s^6 \times s \times s \times s^3$

19. $2^3 \times 5^2 \times 2^4 \times 5^3$

20. $x^3 y^4 x^6 y^5$

21. $x^2 y^3 z^4 x y^5 z^2$

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