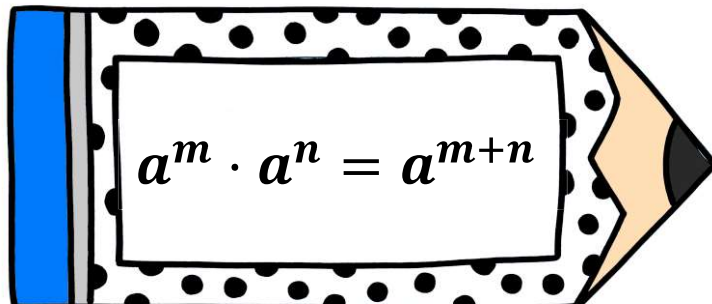


Notes: Use the **Product Rule** to Simplify Expressions

The **Product Rule** states that when we _____ two or more terms that have the same _____, we can _____ their _____.



WITH NUMBERS

$$2^3 \cdot 2^4 = 2^{3+4} =$$

WITH VARIABLES

$$x^2 \cdot x^3 = x^{2+3} =$$

Simplify each expression using the product rule.

1. $x^4 \cdot x^6$

2. $y \cdot y^{10}$

3. $m(m^2)(m^5)$

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

5. $-6xy^2(x^2)(4y^4)$

6. $-xy(x^2y)(3y)$

7. $\frac{1}{6}x^2(-3x^2y)$

8. $0.5xy(12x^2y^5z)$

9. $\frac{1}{2}a^2b(-4ab)(0.5b^2c)$

10. $x^2(-2x^2y) + (-3x^4y)$

11. $m^2n(4m^3) - (-5m^5n)$

12. $-2x^2y^2(-xy) + 4x^3y(y^2)$

A. Use the Product Rule to Simplify Expressions

Simplify each expression using the product rule.

1. $y \cdot x^2y^3$

2. $x^3y \cdot 2y^3$

3. $-2a^2(-2a^3b^3)$

4. $5x^3y^3(4x^2y)$

5. $4m^2n(-mn)$

6. $x(xy^2)(15y^5)$

7. $0.2x^2(10x^6)$

8. $ab(2a^2b)(b^3)$

9. $\frac{1}{2}mn^4(m^2n)$

10. $\frac{1}{3}x^3(4x^2y)(6xy^2)$

11. $-4y^2(-3y^3z)$

12. $\frac{2}{3}a^4b(-9a^2b)$

13. $0.5x^4y^2(16x^2y^6)$

14. $7m^6n^2(4m^2)(\frac{1}{2}n)$

15. $2x^2(-3xy^2) + 4x^3y^2$

16. $4x^2y(xy) + 2x^2$

17. $-\frac{1}{2}a^4b(ab) + 5a^3b^2(\frac{1}{2}a^2)$

18. $3x^4y^3(\frac{2}{3}x^2) - 2(x^5)(xy^3)$