

Multiplication of Polynomials

EXAMPLES

Multiply the polynomials. Simplify and write the answer alphabetically and in descending order of the power of the terms.

$$\begin{aligned}(x + 3y)(x^3 - 4x + 8) &= x(x^3 - 4x + 8) + 3y(x^3 - 4x + 8) \\ &= x^4 - 4x^2 + 8x + 3x^3y - 12xy + 24y \\ &= x^4 + 3x^3y - 4x^2 + 8x - 12xy + 24y\end{aligned}$$

$$\begin{aligned}(x - y)^2(4x + y)^2 &= (x^2 - 2xy + y^2)(16x^2 + 8xy + y^2) \\ &= x^2(16x^2 + 8xy + y^2) - 2xy(16x^2 + 8xy + y^2) + y^2(16x^2 + 8xy + y^2) \\ &= 16x^4 + 8x^3y + x^2y^2 - 32x^3y - 16x^2y^2 - 2xy^3 + 16x^2y^2 + 8xy^3 + y^4 \\ &= 16x^4 - 24x^3y + x^2y^2 + 6xy^3 + y^4\end{aligned}$$

Directions Multiply. Write the answer alphabetically in descending order of the power of the terms.

1. $(x^2 + 3)(x^3 + 2x)$ _____
2. $(2x - 4y)(x^3 + x)$ _____
3. $(5x^2 - 4)(x^2 + 15)$ _____
4. $(x^3 + 7x^2 - 2)(x - y)$ _____
5. $(8x^2 + y)(x - 2y + 7y^2)$ _____
6. $(3x^3 + y)(x^2 - 2x + 4y + 1)$ _____
7. $(4x^2 - 4)(6y^2 - 2x + 3)$ _____
8. $(x + 3)(x^2 - xy + y^2)$ _____
9. $(3x + 2y)(x - 3y + 8y^2)$ _____
10. $(x^2 - 7)(x^2 + 2xy^2 - 3)$ _____
11. $(x - 4y + 8z)(4x + 9y - 7z)$ _____
12. $(x^3 + 2x^2y + 2y)(x^2 - 3y + 2)$ _____
13. $(3x - y)(x^2 + 3xy - 4)$ _____
14. $(7x + 2y - 8z)(2x - 4z)$ _____
15. $(2x^2 - 4x)(x + 3y^2 - 7y)$ _____
16. $(4x^3 - 2y^2 - 12)(2x + 3y^2)$ _____
17. $(x^2 + 7xy - 4y)(x^2 - 5xy)$ _____
18. $(x - 3y)^2(5x + 2y)$ _____
19. $(3x + 5)^2(2x + y)$ _____
20. $(4x - y)^2(x - y)^2$ _____