

Basic Factoring Rules

1. Look for **common factors** you can divide out. $6x^2 + 9x = 3x(2x + 3)$
2. If it has **two terms**, look for these patterns:
 - Difference of two squares
 $a^2 - b^2 = (a + b)(a - b)$ $x^2 - 16 = (x + 4)(x - 4)$
 - Difference of two cubes
 $a^3 - b^3 = (a - b)(a^2 + 2ab + b^2)$ $x^3 - 27 = (x - 3)(x^2 + 6x + 9)$
 - Sum of two cubes
 $a^3 + b^3 = (a + b)(a^2 - 2ab + b^2)$ $x^3 + 8 = (x + 2)(x^2 - 4x + 4)$
3. For a trinomial, if there's **no number in front** of the x^2 , write $(x \quad)(x \quad)$. Look for two numbers that multiply to make the last number and add to make the middle number. $x^2 + 7x + 12 = (x + 3)(x + 4)$

Rule 1:

1. $3x^3 - 12x^2 + 15x$
2. $4x^2 - 20x$
3. $6ab^2 + 9ab$
4. $45x^2 - 9$

Combo:

14. $2x^3 + 14x^2 + 24x$
15. $3x^4 - 6x^3 - 45x$
16. $4x^3 - 36x^2$

Rule 2:

5. $x^2 - 81$
6. $x^2 - y^2$
7. $25a^2 - 16b^2$
8. $x^3 + 125$
9. $x^3 - 64$

Rule 3:

10. $x^2 + 10x + 16$
11. $x^2 - 11x + 24$
12. $x^2 + 3x - 28$
13. $x^2 - 8x - 48$