

Factoring a Difference or a Sum of Two Cubes

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

Strategy for Factoring Polynomials

1. If there are any common factors, factor them out first.
2. When factoring a binomial, look for the special cases: difference of two squares, difference of two cubes, and sum of two cubes. Remember that a sum of two squares $a^2 + b^2$ is prime.
3. When factoring a trinomial, check to see whether it is a perfect square trinomial.
4. When factoring a trinomial that is not a perfect square, use the ac method.
5. When factoring a polynomial of high degree, use substitution to get a polynomial of degree 2 or 3.
6. If the polynomial has four terms, try factoring by grouping.