FACTORING POLYNOMIALS: GUIDED NOTES

Factor Patterns with Two Terms

Perfect Squares

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

We can only factor a difference (not a sum) of two squares.

Perfect Cubes

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

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

We can factor a sum or difference of two cubes.

Examples

Factor each of the following polynomials completely. If the polynomial is unfactorable, write *prime*.

1) $x^2 + 16$

2) $32h^3 + 4$

3) $y^4 - 81$

Factoring With 4 Terms

Use **grouping** when factoring four terms.

Examples

Factor each of the following polynomials completely. If the polynomial is unfactorable, write *prime*.

4) $2x^3 - 5x^2 + 18x - 45$

5) $-6x^3 - 4x^2 + 6x + 4$

Factoring With 3 Terms

If we can rewrite it in the form of a quadratic, then factor it like a quadratic.

Example

Factor each of the following polynomials completely. If the polynomial is unfactorable, write *prime*.

6) $5x^4 + 31x^2 + 6$