

## Factoring

1. The AC Test to factor the trinomial  $Ax^2 + Bx + C$ .

- (a) Identify coefficients  $A$ ,  $B$ , and  $C$ .
- (b) Find two integers  $P$  and  $Q$  such that

$$P \cdot Q = A \cdot C \quad \text{and} \quad P + Q = B$$

- (c) Rewrite the original trinomial in the form

$$Ax^2 + Px + Qx + C \quad \text{or} \quad Ax^2 + Qx + Px + C$$

- (d) These new polynomials will easily factor by grouping.

2. A special case of the AC test: To factor  $x^2 + Bx + C$ .

- (a) Identify coefficients  $B$  and  $C$ .
- (b) Find two integers  $P$  and  $Q$  such that

$$P \cdot Q = C \quad \text{and} \quad P + Q = B$$

- (c) The factorization is:  $x^2 + Bx + C = (x + P)(x + Q)$

3. The AC Test also works when factoring polynomials such as  $Ax^4 + Bx^2 + C$  or  $Ax^2 + Bxy + Cy^2$ .

4. Factoring differences of squares.

- $A^2 - B^2$

- (a) Identify  $A$  and  $B$ .
- (b)  $A^2 - B^2 = (A + B)(A - B)$

5. Factoring sums and differences of cubes.

- $A^3 - B^3$

- (a) Identify  $A$  and  $B$ .
- (b)  $A^3 - B^3 = (A - B)(A^2 + AB + B^2)$

- $A^3 + B^3$

- (a) Identify  $A$  and  $B$ .
- (b)  $A^3 + B^3 = (A + B)(A^2 - AB + B^2)$