

## 14.7 Factoring: A General Strategy

### Steps of Factoring a Polynomial (p.921)

#### To Factor a Polynomial

A. Always look for a greatest common factor (GCF) first.

B. Then look at the number of terms.

*Two terms:*

$$\begin{cases} A^2 - B^2 = (A+B)(A-B) \\ A^2 + B^2 = \text{prime} \end{cases}$$

*Three terms:* Determine whether the trinomial is a perfect-square trinomial.

$$\begin{cases} A^2 + 2AB + B^2 = (A+B)^2 \\ A^2 - 2AB + B^2 = (A-B)^2 \end{cases}$$

If so, factor accordingly.

If not, try trial and error method, the A&M method, or grouping method.

*Four terms:* Try factoring by grouping:

$$am + an + bm + bn$$

$$a(m+n) + b(m+n)$$

$$(m+n)(a+b)$$

C. Always factor completely.

D. Check by multiplying.

Ex. Factor completely. If a polynomial is prime, state this.

(a)  $b^2 - 28 - 3b$

(b)  $a^4 - 3a^3 + 7a^2 - 21a$

(c)  $x^2 + 9$

(d)  $9t^3 + 12t^2 - 45t$

(e)  $4x^6 - 64x^2$