Algebra 2 Honors **Name**_____
Notes: 3-4 Factoring Polynomials **Date**_____**Block**_____

Factor Theorem:
For any polynomial _____.

Example:

Example 1: Determining Whether a Linear Binomial is a Factor
Determine whether the given binomial is a factor of the polynomial $P(x)$.

A. $(x + 2)$; $(4x^2 – 2x + 5)$

B. $(3x – 6)$; $(3x^4 – 6x^3 + 6x^2 + 3x – 30)$

Check It Out! Example 1
Determine whether the given binomial is a factor of the polynomial $P(x)$.

A. $(x + 1)$; $(x^2 – 3x + 1)$

B. $(x + 2)$; $(3x^4 + 6x^3 – 5x – 10)$

Example 2: Factoring by Grouping
Factor: $x^3 – x^2 – 25x + 25$.

Check It Out! Example 2a
Factor: $x^3 – 2x^2 – 9x + 18$.

Factoring the Sum and the Difference of Two Cubes

Sum of two cubes: _____

Difference of two cubes: _____

Example 3A: Factoring the Sum or Difference of Two Cubes
Factor the expression $4x^4 + 108x$

Example 3B: Factoring the Sum or Difference of Two Cubes
Factor the expression $125d^3 - 8$

Check It Out! Example 3a
Factor the expression $8 + z^6$

Check It Out! Example 3b
Factor the expression $2x^5 - 16x^2$