

Notes for Section R.4 Factoring Polynomials
(pp.37 – 43)

Topics: Factoring polynomials using various techniques

Name:
Date:
Instructor:

Vocabulary to use:

factors

prime

factored form

irreducible polynomials

I. Factoring the Greatest Common Factor

Factor and rewrite the problem using the GCF, then use the Distributive property in reverse to factor out the GCF.

Ex. $3x + 15 =$

Ex. $4y^3 + 10y^2 + 2y =$

Ex. $3m^3 + 6m^2 + 9 =$

Ex. $3x + 3y + cx + cy =$

*Don't leave out the 1 when factoring out the entire term.

*Check by multiplying the factors back to get the original problem.

II. Factoring by Grouping (p. 38)

The "Factoring by Grouping" method groups the first two terms and the second two terms, then follows with a greatest common factor of a parentheses within the two groups.

Ex. $3a^2 - bc + 3b - a^2c =$

*Notice that the problem doesn't begin so that you can find a Greatest Common Factor from the first two and second two terms. Rearrange the terms so that a GCF shows up.

III. Factoring Trinomials by Trial-and-Error(p. 39)

Recall factoring by FOIL from factored form $(ax + b)(cx + d)$.

Ex. $3x^2 + 5x - 2 =$

Find the factors of the product ac and the factors of the product bd . Focus on the coefficient of the middle (x) term.

Ex. $2y^2 - 7y + 3 =$

IV. Factoring Special Patterns (pp. 40 - 41)

A. Perfect Square Trinomials: $x^2 + 2xy + y^2 = (x + y)^2$ and $x^2 - 2xy + y^2 = (x - y)^2$

Ex. $4t^2 + 12t + 9 =$

B. Difference of Two Squares: $x^2 - y^2 = (x + y)(x - y)$

Ex. $9r^2 - 1 =$

C. Omit Difference and Sum of Two Cubes (p.42, example #6) (Tape 12:25 – 14:25)

V. Factoring by Substitution (p. 42)

Substitute another variable to replace (always) the middle term's variable factor. Factor the easier problem, then substitute back to get the original problem's answer.

Ex. $m^4 - 3m^2 - 10 =$

Let $y = m^2$

VI. Summary of Factoring:

1. First look for _____, if there is one.
2. How many _____ in the polynomial?
 - A. 4 or more—use _____
 - B. 3 terms—use _____ backwards or special factoring patterns.
 - C. 2 terms—difference of two squares or prime
3. Use _____ to help with the more complex factoring problems.

*4. Some students may have learned another approach to factoring a trinomial that is called the *ac method*. The videos do not cover this approach, but you can stop by the Tutoring Center to find out about it.

Ex. $6a^2 - 48a - 120 =$

Assignments:

Text: pp. 43 – 45 #1 – 21 every other odd, 23 – 39 eoo, 43 – 51 odd, 63, 79, 81, 83

“A Review of Algebra”: pp. 98 – 100 #5 – 25 odd, 35 – 43 odd, 65, 67, 79, 81

p. 105 #9 – 29 odd, 47, 49