

Algebra 2
Notes Section 4.4
Factoring Quadratic Expressions

Name: Key
Date: _____ Hour: _____

F.O.I.L

Review

Multiply each.

1. $(x-3)(x-4)$

$$\begin{array}{r} x^2 - 4x - 3x + 12 \\ \hline x^2 - 7x + 12 \end{array}$$

2. $(4x-1)(3x+8)$

$$\begin{array}{r} 12x^2 + 32x - 3x - 8 \\ \hline 12x^2 + 29x - 8 \end{array}$$

3. $(2x-5)^2$

$$\begin{array}{r} (2x-5)(2x-5) \\ \hline 4x^2 - 10x - 10x + 25 \\ \hline 4x^2 - 20x + 25 \end{array}$$

4. $(2x+3)(2x-3)$

$$\begin{array}{r} 4x^2 - 6x + 6x - 9 \\ \hline 4x^2 - 9 \end{array}$$

5. $(x+3)(x^2-2x+2)$

$$\begin{array}{r} x^3 - 2x^2 + 2x + 3x^2 - 6x + 6 \\ \hline x^3 + 1x^2 - 4x + 6 \end{array}$$

Review of factoring

A. Finding common factors.

Find the GCF of each expression. Then factor the expression.

1. $4x^2 + 20x - 56$

$$4(x^2 + 5x - 14)$$

2. $2x^3 - 20x^2 + 2x$

$$2x(x^2 - 10x + 1)$$

3. $m^3n^2 + 2m^2n^3 - 3mn$

$$mn(m^2n + 2mn^2 - 3)$$

B. Factoring by grouping

1. $x(x-3) - 2(x-3)$

$$(x-3)(x-2)$$

2. $x(x+4) - (x+4)$

$$(x+4)(x-1)$$

C. Factoring by grouping

1. $x^2 + 4x - 2x - 8$

$$x(x+4) - 2(x+4)$$

$$(x+4)(x-2)$$

D. Factoring when $a = 1$

1. $x^2 + 9x + 20$

$$(x+5)(x+4)$$

2. $x^2 + 14x - 72$

$$(x+18)(x-4)$$

3. $x^2 - 4x - 12$

$$(x-6)(x+2)$$

E. Factoring ax^2+bx+c when $a \neq 1$

1. $2x^2+11x+12$

~~$(2x-2)(x+6)$~~
 ~~$(2x-6)(x+2)$~~
 ~~$(2x-4)(x+3)$~~
 $(2x+3)(x+4)$

2. $4x^2-4x-3$

$(2x+1)(2x-3)$
 ~~$(4x)(1x)$~~

3. $6x^2+13x-50$

$(6x+25)(1x-2)$

Special Cases

F. Difference of two squares

1. a^2-b^2

$(a+b)(a-b)$

2. x^2-25

$(x-5)(x+5)$

3. $9x^2-49$

$(3x-7)(3x+7)$

4. $64y^2-81w^2$

$(8y-9w)(8y+9w)$

- 1
- 4
- 9
- 16
- 25
- 36
- 49
- 64
- 81
- 100
- 121

G. Perfect Square Trinomial

1. $x^2-10x+25$

\downarrow must be a(+)
 $x \sqrt{\quad} \quad 5 \sqrt{\quad}$
 $(x-5)(x-5)$
 $(x-5)^2$

2. $9x^2+12xy+4y^2$

$3x \sqrt{\quad} \quad 2y \sqrt{\quad}$
 $(3x+2y)^2$

3. $4x^2-12x+9$

$2x \sqrt{\quad} \quad 3 \sqrt{\quad}$
 $(2x-3)^2$

When factoring quadratic expressions:

1. Write in standard form (highest exponent to lowest)
2. Factor out the Greatest Common Factor (GCF)
3. Look for special cases

Whenever factoring, ALWAYS look for a GCF first !!!!

Factor completely and **check** your answer.

1. $4a^2-40a+100$

$4(a^2-10a+25)$
 $a \sqrt{\quad} \quad 5 \sqrt{\quad}$
 $4(a-5)^2$

2. $3x^3-24x^2y+48xy^2$

$3x(x^2-8xy+16y^2)$
 $3x(x-4y)^2$

3. $6x^2+21x-12$

$3(2x^2+7x-4)$
 $3(2x-1)(x+4)$

4.4 p 221 15-58 61-77 e.o.o