

Name:

Date:

Period:

4.1 Factoring Quadratic review Notes

Factoring Completely Steps

1. Check for a greatest common factor GCF, and factor out.
2. Check for special cases, perfect square trinomial or difference of 2 squares
3. If it is not a special case, factor.

Factor out a GCF

Ex 1: $12k - 18$

factors of
 12: 1, 2, 3, 4, 6, 12
 18: 1, 2, 3, 6, 9, 18

GCF: 6

$6(2k - 3)$

Ex 2: $14m^6 - 35m^3 - 7m^2$

GCF: $7m^2$

$7m^2(2m^4 - 5m - 1)$

Factoring trinomials

$ax^2 + bx + c$

when $a=1$

Ex 3: $w^2 - 15w + 26$

$$\begin{array}{l} -1 - 26 \\ -2 - 13 \end{array}$$

← both (-)
 product (+), sum (-)

$(w - 2)(w - 13)$

ALWAYS
 look for a
GCF first
 (step 1)

Ex 4: $2k^2 - 16k - 40$

$2(k^2 - 8k - 20)$

$$\begin{array}{r} 1 \quad -20 \\ 2 \quad -10 \\ 4 \quad -5 \end{array}$$

$2(k - 10)(k + 2)$

Special Case
 Perfect Square
 Trinomials.
 (step 2)

Ex 5: $a^2 + 12a + 36$

$$\begin{array}{c} \wedge \quad \uparrow \quad \wedge \\ a \cdot a \quad | \quad b \cdot b \\ \quad \quad \quad \uparrow \\ \quad \quad \quad b \cdot a \cdot 2 \end{array}$$

$(a + 6)^2$

see 1.6 notes

see 3.4 notes

multiply
 $(x-3)(x+3)$

$x^2+3x-3x-9$
 x^2-9
 Special Case
 Difference of Two
 Squares (step 2)
 no bx term

difference
 y^2-81
 $y \cdot y \quad 9 \cdot 9$
 $(y-9)(y+9)$

Ex 7. $9x^2 - 25y^4$
 $3x \cdot 3x \quad 5y^2 \cdot 5y^2$
 $(3x-5y^2)(3x+5y^2)$

Factoring Trinomials when $a > 1$

Ex 8 $2x^2 - 15x + 18$
 $2x^2 \cdot 18$
 $36x^2$
 $-3x$
 $-12x$
 $-15x$

1	36
2	18
-3	-12
4	9
6	6

$2x^2 - 12x - 3x + 18$
 $(2x^2 - 12x) + (-3x + 18)$
 $2x(x-6) - 3(x-6)$
 $(2x-3)(x-6)$

Ex 9 $12x^2 + 5x - 2$
 $-24x^2$
 $-3x$
 $8x$
 $5x$

1	24
2	12
-3	8
1	6

 Grouping
 $(12x^2 - 3x) + (8x - 2)$
 $3x(4x-1) + 2(4x-1)$
 $(4x-1)(3x+2)$
 rectangle

3x	2	
4x	12x^2	8x
-1	-3x	-2

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

Factor Completely.

Ex 10 $16m^2 + 60m - 54$
 ① GCF?
 $2(8m^2 + 30m - 27)$
 ② not a special case

1	216
2	108
3	72
4	54
-6	36
8	27
9	24

 $2(8m^2 - 6m) + (36m - 54)$
 $2m(4m-3) + 9(4m-3)$
 $2(2m+9)(4m-3)$

Ex 11 $2a^2b - 32a^4b$
 ① GCF $2a^2b(1-16a^2)$
 ② Difference of 2 squares
 $2a^2b(1-4a)(1+4a)$

Always check by multiplying your factors to verify your original expression.