Factoring Methods Checklist

1. Greatest Common Factor (GCF)

Example $14x^4 - 21x^2$ $\quad 14x^4 = 2 \cdot 7 \cdot x \cdot x \cdot x \cdot x$

$= 7x^2(2x^2 - 3)$ $\quad 21x^2 = 3 \cdot 7 \cdot x \cdot x$

GCF = $7x^2$

Note: Divide each term by the GCF- check by distributing

2. Difference of Squares (2 terms, sign is always negative)

Pattern (+)(-)

Examples $x^2 - 64$ $\quad (x + 8)(x - 8)$

$9x^2 - 49$ $\quad (3x + 7)(3x - 7)$

Note: Find the square root of each term

3. Perfect Square Trinomials (PST) (3 terms, constant is positive)

Pattern $(+)^2$ or $(-)^2$

Examples $16x^2 + 24x + 9$ $\quad (4x + 3)^2$

$x^2 - 4x + 4$ $\quad (x - 2)^2$

Note: Find the square root of the 1st and 3rd term - Be sure to check middle term

$4x \cdot 3 \cdot \mathbf{2} = 24x$

$x \cdot -2 \cdot \mathbf{2} = -4x$

4. Trinomial Factoring

8.1 $x^2 + bx + c$ 8.2 $ax^2 + bx + c$

Examples $x^2 - 5x + 6$ $3x^2 - 4x - 7$

$(x \quad)(x \quad)$ $(3x \quad)(x \quad)$

Factors of 6	Factors of 3	Factors of -7
1, 6 2, 3	1, 3	1, -7
-1, -6 -2, -3		-1, 7

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

Note: FOIL to check correct factorization

5. Grouping (typically 4 or 5 terms)

Example $x^3 + 2x^2 + 3x + 6$

$x^3 + 2x^2 + 3x + 6$ or $x^3 + 3x + 2x^2 + 6$

GCF $x^2(x + 2) + 3(x + 2)$ GCF $x(x^2 + 3) + 2(x^2 + 3)$

$(x^2 + 3)(x + 2)$ $(x + 2)(x^2 + 3)$

Note: Use a pattern to group terms together and find the GCF of each "group" – several patterns may work for a given expression

6. Sum/Difference of Cubes

Example $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Solving a Factored Equation

Set each quantity equal to zero and solve for the variable

$(4x + 1)(4x - 1) = 0$

$4x + 1 = 0$ $4x - 1 = 0$

$4x = -1$ $4x = 1$

$x = -\frac{1}{4}$ $x = \frac{1}{4}$

Name : _____

Factoring Linear Expressions

Sheet 1

Factorize each linear expression.

1) $6x + 9$

2) $-20y - 5z$

3) $15 - 3a$

4) $2m + 2$

5) $39u - 52v + 13$

6) $10z - 60$

7) $44p + 11q$

8) $42 + 35w$

9) $81n - 36$

10) $40b - 80c - 40d$

Kuta Software - Infinite Algebra 1

Name_____

Factoring Trinomials (a = 1)

Date_____ Period____

Factor each completely.

1) $b^2 + 8b + 7$

2) $n^2 - 11n + 10$

3) $m^2 + m - 90$

4) $n^2 + 4n - 12$

5) $n^2 - 10n + 9$

6) $b^2 + 16b + 64$

7) $m^2 + 2m - 24$

8) $x^2 - 4x + 24$

9) $k^2 - 13k + 40$

10) $a^2 + 11a + 18$

11) $n^2 - n - 56$

12) $n^2 - 5n + 6$

Name_____

Factoring Trinomials (a > 1)

Date_____ Period____

Factor each completely.

1) $3p^2 - 2p - 5$

2) $2n^2 + 3n - 9$

3) $3n^2 - 8n + 4$

4) $5n^2 + 19n + 12$

5) $2v^2 + 11v + 5$

6) $2n^2 + 5n + 2$

7) $7a^2 + 53a + 28$

8) $9k^2 + 66k + 21$

9) $15n^2 - 27n - 6$

10) $5x^2 - 18x + 9$

11) $4n^2 - 15n - 25$

12) $4x^2 - 35x + 49$

13) $4n^2 - 17n + 4$

14) $6x^2 + 7x - 49$

15) $6x^2 + 37x + 6$

16) $-6a^2 - 25a - 25$

17) $6n^2 + 5n - 6$

18) $16b^2 + 60b - 100$

13) $b^2 - 6b + 8$

14) $n^2 + 6n + 8$

15) $2n^2 + 6n - 108$

16) $5n^2 + 10n + 20$

17) $2k^2 + 22k + 60$

18) $a^2 - a - 90$

19) $p^2 + 11p + 10$

20) $5v^2 - 30v + 40$

21) $2p^2 + 2p - 4$

22) $4v^2 - 4v - 8$

23) $x^2 - 15x + 50$

24) $v^2 - 7v + 10$

25) $p^2 + 3p - 18$

26) $6v^2 + 66v + 60$

Kuta Software - Infinite Algebra 2

Name_____

Factoring A Sum/Difference of Cubes

Date_____ Period____

Factor each completely.

1) $x^3 + 125$

2) $a^3 + 64$

3) $x^3 - 64$

4) $u^3 + 8$

5) $x^3 - 27$

6) $125 - x^3$

7) $1 - a^3$

8) $a^3 + 125$

9) $x^3 + 27$

10) $x^3 + 1$

11) $8x^3 + 27$

12) $-27u^3 + 125$

Kuta Software - Infinite Algebra 2 Name_____

Factoring By Grouping

Date_____ Period____

Factor each completely.

1) $12a^3 - 9a^2 + 4a - 3$

2) $2p^3 + 5p^2 + 6p + 15$

3) $3n^3 - 4n^2 + 9n - 12$

4) $12n^3 + 4n^2 + 3n + 1$

5) $m^3 - m^2 + 2m - 2$

6) $5n^3 - 10n^2 + 3n - 6$

7) $35xy - 5x - 56y + 8$

8) $224az + 56ac - 84yz - 21yc$

9) $mz - 5mh^2 - 5nz + 25nh^2$

10) $12xy - 28x - 15y + 35$

11) $40xy + 30x - 100y - 75$

12) $75a^2c - 45a^2d - 30bc + 18bd$

13) $192x^2y + 72x^3 - 24rxy - 9rx^2$

14) $90au - 36av - 150yu + 60yv$

15) $140ab - 60a^2 + 168b - 72a$

16) $105ab - 90a - 21b + 18$

17) $16x^2c + 8xyd - 16x^2d - 8xyc$

18) $150m^2nz + 20mn^2c - 120m^2nc - 25mn^2z$

19) $105xuv + 60xv - 70xu - 90xv^2$

20) $112xy - 16x + 128x^2 - 14y$