Warm Up

Factor each of the following:

1. $10x^2y^5 + 20x^7y^3 - 25x^4y^9$

$5x^2y^3(2y^2 + 4x^5 - 5x^2y^6)$

2. $1m^2 + 13m - 30$

$(m+15)(m-2)$

m   −30
A   13
N   15, −2

3. $x^2 - 10x + 24$

$(x-6)(x-4)$

m   24
A   −10
N   −6, −4

4. $3x^2 + 3x - 36$

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

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

m   −12
A   +1
N   4, −3

II. Factoring Trinomials:

Type 2: Polynomials of the form $ax^2 + bx + c$

- Most efficient technique to factor most trinomials of this form is a process know as "DECOMPOSITION".

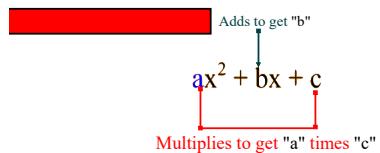Note: a>1

Hard Trinomials

- has <u>three</u> terms with the form...

$$ax^2 + bx + c$$

- a hard trinomial has an "a" value **not equal to 1**.

- we use a method of <u>decomposition</u> to factor them.

DECOMPOSITION METHOD

- here's how it goes... "What two numbers?"

Adds to get "b"

$$ax^2 + bx + c$$

Multiplies to get "a" times "c"

- once you find the two numbers, use them to break the MIDDLE TERM into two pieces (decompostion).

- then, factor by grouping.

- check it out...

EXAMPLES:

1) $2x^2 + 5x - 12$ M -24
    $2x^2 + 8x - 3x - 12$ A 5
    $2x(x+4) - 3(x+4)$ N +8,-3
    $(x+4)(2x-3)$

2) $5x^2 - 13x - 6$ M -30
    $5x^2 - 15x + 2x - 6$ A -13
    $5x(x-3) + 2(x-3)$ N -15,2
    $(x-3)(5x+2)$

3) $9x^2 - 12x + 4$ M 36
    $9x^2 - 6x - 6x + 4$ A -12
    $3x(3x-2) - 2(3x-2)$ N -6,-6
    $(3x-2)(3x-2)$

4) $18x^2 - 33x + 9$ M 18
    $3(6x^2 - 11x + 3)$ A -11
    $3[6x^2 - 9x - 2x + 3]$ N -9,-2
    $3[3x(2x-3) - 1(2x-3)]$
    $3(2x-3)(3x-1)$

1. $3p^2 - 2p - 5$ M -15
     $3p^2 + 3p - 5p - 5$ A -2
     $3p(p+1) - 5(p+1)$ N -5,3
     $(p+1)(3p-5)$

2. $2n^2 + 3n - 9$ M -18
     $2n^2 + 6n - 3n - 9$ A +3
     $2n(n+3) - 3(n+3)$ N 6,-3
     $(n+3)(2n-3)$

Math 10B   Name_____

Factoring: Hard Trinomials   Date_____

Factor each completely.

1) $6m^2 + 2m - 8$

2) $3x^2 - 16x + 5$

3) $28r^2 - 116r + 16$

4) $2n^2 - 17n - 9$

5) $3r^2 + 2r - 16$

6) $5a^2 - 34a + 45$

7) $8x^2 - 50x + 50$

8) $4n^2 - 15n + 9$

9) $4x^2 + 17x + 4$

10) $4m^2 + 13m + 10$

11) $4b^2 - 3b - 10$

12) $8n^2 - 26n - 24$

13) $u^2 + 16uv + 64v^2$

14) $2x^2 - 22xy + 48y^2$

15) $x^2 - 11xy + 30y^2$

16) $4a^2 - 8ab - 12b^2$