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. $m^2 + 13m - 30$

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

M −30
A 13
N 15 −2

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

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

M 24
A −10
N −6 −4

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

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

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

M −12
A 1
N −3 4

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 three terms with the form...

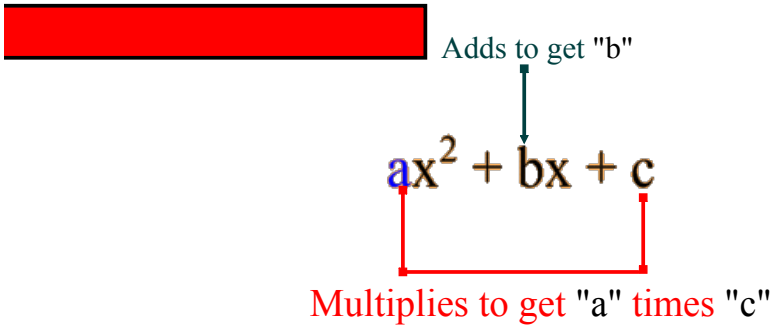
$$ax^2 + bx + c$$

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

- we use a method of decomposition to factor them.

DECOMPOSITION METHOD

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



- 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
A 5
N 8 -3

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

2) $5x^2 - 13x - 6$

M -30
A -13
N -15 +2

$5x^2-15x+2x-6$
$5x(x-3)+2(x-3)$
$(x-3)(5x+2)$

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

M 36
A -12
N -6 -6

$9x^2-6x-6x+4$
$3x(3x-2)-2(3x-2)$
$(3x-2)(3x-2)$
$(3x-2)^2$

4) $18x^2 - 33x + 9$

M 18
A -11
N -9 -2

$3(6x^2-11x+3)$
$3(6x^2-9x-2x+3)$
$3(3x(2x-3)-1(2x-3))$
$3(2x-3)(3x-1)$

① $3p^2 - 2p - 5$

M -15
A -2
N 3 -5

$3p^2 + 3p - 5p - 5$

$3p(p+1) - 5(p+1)$

$(3p-5)(p+1)$

② $2n^2 + 3n - 9$

M -18
A +3
N -3 6

$2n^2 + 6n - 3n - 9$

$2n(n+3) - 3(n+3)$

$(n+3)(2n-3)$

Check

$(n+3)(2n-3)$

$2n^2 - 3n + 6n - 9$

$2n^2 + 3n - 9$

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