

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

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

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: $a > 1$

$$ax^2 + bx + c$$

$$a > 1$$

Hard Trinomials

- has three terms with the form...

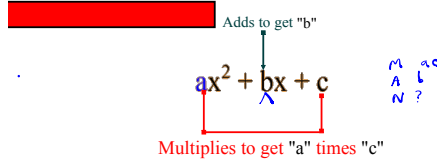
$$ax^2 + bx + c$$

- 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 (decomposition).

- then, factor by grouping.

- check it out...

EXAMPLES:

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

2) $5x^2 - 13x - 6$ $M = -30$
 $5x^2 - 15x + 2x - 6$ $A = -12$
 $5x(x-3) + 2(x-3)$ $N = -15, 2$
 $(x-3)(5x+2)$

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

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

$$\textcircled{1} 6m^2 + 2m - 8$$
$$= 2(3m^2 + m - 4)$$

Remember to factor out the gcf
before applying decomposition.