4.2 Mulitplying Binomials & Factoring by Grouping

A. Multiplying Two Binomials using Box Method

1. $(x+y)(a+b)$

$= ax+bx+ay+by$

	x	y
a	ax	ay
b	bx	by

2. $(x+2)(y-3)$

$= xy-3x+2y-6$

	y	-3
x	xy	$-3x$
2	$2y$	-6

3. $(3x-4)(5y+z)$

$= 15xy-20y+3xz-4z$

	$3x$	-4
$5y$	$15xy$	$-20y$
z	$3xz$	$-4z$

4. $(2x^2y-1)(3xy+7)$

$= 6x^3y^2-3xy+14x^2y-7$

	$2x^2y$	-1
$3xy$	$6x^3y^2$	$-3xy$
7	$14x^2y$	-7

5. $(2-x)(7+3y)$

$= 14+6y-7x-3xy$

6. $(5x-3w)(2j-3k)$

7. $(2x^5y^3-3xy^3)(x-2y)$

8. $(5a+2b)(4w-7k)$

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B. Factoring by Grouping

1. $ax + ay + bx + by$

$= (a+b)(x+y)$

	x	y
a	ax	ay
b	bx	by

2. $8x - 12xy - 6 + 9y$

$= (4x-3)(2-3y)$

	2	$-3y$
$4x$	$8x$	$-12xy$
-3	-6	$9y$

3. $xy - 7x - 3y + 21$

$= x(y-7) - 3(y-7)$

$= (y-7)(x-3)$

4. $4x^2y^3 - 2xy^2 + 6xy - 3$

$= (2xy^2+3)(2xy-1)$

	$2xy$	-1
$2xy^2$	$4x^2y^3$	$-2xy^2$
3	$6xy$	-3

5. $3(4x-1) + 5y(4x-1)$

$= (4x-1)(3+5y)$

6. $2(x^2+x+1) - 5y(x^2+x+1)$

$= (x^2+x+1)(2-5y)$

7. $4ax - 3by + 2bx - 6ay$

$= (2a+b)(2x-3y)$

	$2x$	$-3y$
$2a$	$4ax$	$-6ay$
b	$2bx$	$-3by$

8. $10x^4y^2 - 5x^2y + 4x^2y - 2$

$= (5x^2y+2)(2x^2y-1)$

	$2x^2y$	-1
$5x^2y$	$10x^4y^2$	$-5x^2y$
2	$4x^2y$	-2

9. $15vx - 6vy + 5wx - 2wy$

$= 3v(5x-2y) + w(5x-2y)$

$= (5x-2y)(3v+w)$

10. $2x^2y - 3xy + 4y - 4x^2 + 6x - 8$

$= (y-2)(2x^2-3x+4)$

	$2x^2$	$-3x$	4
y	$2x^2y$	$-3xy$	$4y$
-2	$-4x^2$	$6x$	-8

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Homework

Set 1: Handout #1bdf, 2ace, 3abcdef

Set 2: Handout #2abcdef, 4abcdef

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