9/28/2012 - Sec 6.2 (cont.) Sec 6.3 Math 1010

Sec 6.2 cont.

$-2p^2 - 5p + 12$

$(-2p+3)(p+4)$

O: $-8p$
I: $3p$
$-5p$

or $-1(2p^2+5p-12)$

ac

-24	5
~~$-1, 24$~~	~~23~~
~~$-2, 12$~~	~~10~~
$-3, 8$	5
$-4, 6$	

$a \to \frac{-3}{2}, \frac{8}{2} \leftarrow a$

$\frac{-3}{2}, \frac{4}{1}$

$* -(2p-3)(p+4)$

$(-2p+3)(p+4)$

or $(2p-3)(-p-4)$

$2(x+3)^2 + 5(x+3) - 12$ $\quad ax^2+bx+c$

Substitution

$u = (x+3)$

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

$2u^2 + 5u - 12$

$(2u-3)(u+4)$

Resubstitute $u = x+3$

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

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

$\boxed{(2x+3)(x+7)}$

$6r^4 - 13r^2 + 5$

$(r^2)^2 = r^4$

$u = r^2$, $u^2 = (r^2)^2 = r^4$

$6u^2 - 13u + 5$

ac

30	-13
~~$-1, -30$~~	~~-31~~
~~$-2, -15$~~	~~-17~~
$-3, -10$	-13
$-5, -6$	

$6u^2 - 3u - 10u + 5$

$3u(2u-1) - 5(2u-1)$

$(2u-1)(3u-5)$

$u = r^2$

$(2r^2-1)(3r^2-5)$

positive

$x^2 + 3x + 2 = (x+2)(x+1)$

same sign in factor the sign

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

#30 ~~$(a+2b)^2 - 4(a+2b)^3 +$~~

#30 $8m^2n^2 - 10mn + 3 = (4mn-1)(2mn-3)$

$4, 2$; $-$; $+$

$(2mn-1)(4mn-3)$

O: $-6mn$
I: $-4mn$
$-10mn$ ✓

O: $-12mn$
I: $-2mn$
$-14mn$

$8m^2n^2 - 10mn + 3$

$\frac{-6}{8}, \frac{-4}{8}$

$-\frac{3}{4}, -\frac{1}{2}$

$(4mn-3)(2mn-1)$

ac	b
24	-10
-6, -4	-10 ✓

Sec 6.3 Special Factoring

Recall Special Products

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

$$(x+y)^2 = x^2 + 2xy + y^2$$

$$(x-y)^2 = x^2 - 2xy + y^2$$

Difference of Squares

* $x^2 - y^2 = (x+y)(x-y)$

Ex: $x^2 - 16 = x^2 - 4^2$

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

Ex: $9y^2 - 25$

$(3y)^2 - 5^2$

$(3y+5)(3y-5)$

Ex: $x^4 - 81$

$(x^2)^2 - 9^2$

$(x^2+9)(x^2-9)$

$\boxed{(x^2+9)(x+3)(x-3)}$

Perfect Square trinomials

$$x^2 + 2xy + y^2 = (x+y)^2$$
$$x^2 - 2xy + y^2 = (x-y)^2$$

Ex: $x^2 + 6x + 9$

$x^2 + 2 \cdot 3 \cdot x + 3^2$

$(x+3)^2$

Ex: $m^2 - 8m + 16$

$m^2 - 2 \cdot 4m \quad 4^2$

$(m-4)^2$

Ex of using both

$m^2 - 8m + 16 - p^2$

$(m-4)^2 - p^2$

$((m-4)+p)((m-4)-p)$

$(m-4+p)(m-4-p)$

Difference of Cubes

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

opposite

Ex: $m^3 - 8$

$m^3 - 2^3$

$(m-2)(m^2 + 2m + 2^2)$

$(m-2)(m^2 + 2m + 4)$

$125y^3 - 512$

$(5y)^3 - 8^3$

$(5y-8)((5y)^2 + 5y(8) + 8^2)$

$(5y-8)(25y^2 + 40y + 64)$

Cubes to Look for

$1^3 = 1$	$6^3 = 216$
$2^3 = 8$	$7^3 = 343$
$3^3 = 27$	$8^3 = 512$
$4^3 = 64$	$9^3 = 729$
$5^3 = 125$	$10^3 = 1000$

Sum of Cubes

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