Review: multiply the polynomials.

$(a-b)(a+b) = a^2-b^2$

$(a+b)(a+b) = a^2+2ab+b^2$

$(a-b)(a-b) = a^2-2ab+b^2$

$(a+b)(a^2-ab+b^2) = a^3+b^3$

$(a-b)(a^2+ab+b^2) = a^3-b^3$

$= a^3+a^2b+ab^2-a^2b-ab^2-b^3$

5.5

35. $ax+bx-ay-by$

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

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

5.5

factoring trinomials of the form

$$ax^2+bx+c$$

when $a=1$, we look for factors of c that sum to b

when $a \neq 1$, we will look for factors of $c \cdot a$ that sum to b, rewrite bx as a sum of 2 terms, and factor by grouping

80. $6y^2+5y-6$

factors of $6(-6)=-36$ that sum to 5

$(-9)(4)$

$(9)(-4)$

$6y^2+9y-4y-6$

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

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

88. $4a^2-a-5$

factors of $4(-5)$ that sum to -1

$4a^2+4a-5a-5$

$4a(a+1)-5(a+1)$

$(a+1)(4a-5)$

100. $6x^2+41xy-7y^2$

$6(-7)=-42=42(-1)$

$6x^2+42xy-xy-7y^2$

$6x(x+7y)-y(x+7y)$

$(x+7y)(6x-y)$

106. $6-7x-5x^2$ $= -1(5x^2+7x-6)$

$6(-5) = -30 = (-10)\cdot 3$ $= -1(5x-3)(x+2)$

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

$2(3-5x)+x(3-5x)$

$(3-5x)(2+x)$

114. $8a^4+37a^3b-15a^2b^2$

$8(-15) = -2\cdot 2\cdot 2\cdot 3\cdot 5 = 40(-3)$

$8a^4+40a^3b-3a^3b-15a^2b^2$

$8a^3(a+5b)-3a^2b(a+5b)$

$(a+5b)(8a^3-3a^2b)$

$a^2(a+5b)(8a-3b)$

122. $2a^2b^4+9ab^3-18b^2$

$b^2(2a^2b^2+9ab-18)$

$2(-18) = 12(-3)$

$6 \cdot 3 = -36$

$b^2(2a^2b^2+12ab-3ab-18)$

$b^2[2ab(ab+6)-3(ab+6)]$

$b^2(ab+6)(2ab-3)$

$(ab^3+6b^2)(2ab-3)$

$(ab+6)(2ab^3-3b^2)$

136. $x^{3n}+10x^{2n}+16x^n$

$x^n(x^{2n}+10x^n+16)$

$x^n(x^n+8)(x^n+2)$

$x^n[x^{2n}+8x^n+2x^n+16]$

$x^n[x^n(x^n+8)+2(x^n+8)]$

$x^n(x^n+8)(x^n+2)$

96. $10x^2 - 29x + 10$

$10(10) = (-25)(-4) = -29$

$10x^2 - 25x - 4x + 10$

$5x(2x-5) - 2(2x-5)$

$(2x-5)(5x-2)$

98. $4x^2 - 6x + 1$

$4(1) =$ $+$ $= -6$

$(-4)(-1)$
$2\ (-2)$

not factorable

5.5

#79-137 odd