Ex 2.10 Exercise 2.10 Feb 5 HW

42. $x^4 - 5x^2 + 4$ $\quad ac = x^2 \times 4 = 4x^2$

$ax^2 + bx + c$ $\quad b = -5x$

$4x \times x$ (NO)

$-4x \times -x$ (Yes)

$= x^4 - 4x^2 - x^2 + 4$

$= -4(x^2-1) + x^2(x^2-1)$

~~$= -4(x^2+1)(x^2-1) + x^2(x^2+1)(x^2-1)$~~ $a=1$ $b=1$ $a^2-b^2=(a+b)(a-b)$

~~$= -4(x+1)(x-1) + x^2(x+1)(x-1)$~~

43. $-48 - 3y^2$

$= -3(y^2 + 16)$

46. $9(a+b)^2 - (a-b)^2 \longrightarrow a^2 - b^2 = (a+b)(a-b)$

$= [3(a+b)]^2 - (a-b)^2$ $\quad a = 3(a+b) = 3a+3b$

$b = (a-b)$

$= (3a+3b+a-b)(3a+3b-(a-b))$

$= (4a+2b)(2a+4b)$

2 2

$= 4(2a+b)(a+2b)$

47. $(a-b)^2 - 16(a+2b)^2$

$= (a-b)^2 - [4(a+2b)]^2$ $\quad a = a-b$ $\quad b = 4a+8b$

$= (a-b+4a+8b)(a-b-(4a+8b))$

$= (5a+7b)(-3a-9b) = -3(5a+7b)(a+3b)$

-3

2.10 Exercise

48. $25(2x+1)^2 - (9x-1)^2$ $\quad a = 10x+5$, $b = 9x-1$

$= [5(2x+1)]^2 - (9x-1)^2$

$= (10x+5+9x-1)(10x+5-(9x-1))$

$= (19x+4)(x+6)$

49. $4(x-y)^2 - 16(x+y)^2$ $\quad a = 2x-2y$, $b = 4x+4y$

$= [2(x-y)]^2 - [4(x+y)]^2$

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

$= (6x+2y)(-2x-6y)$

$2 \qquad -2$

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

50. $25(x+2y)^2 - 9(x-2y)^2$

$= [5(x+2y)]^2 - [3(x-2y)]^2$ $\quad a = 5x+10y$, $b = 3x-6y$

$= (5x+10y+3x-6y)(5x+10y-(3x-6y))$

$= (8x+4y)(2x+16y)$

$4 \qquad 2$

$= 8(2x+y)(x+8y)$

42. $= (x^2-1)(x^2-4)$

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

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

18. $m^4 - 16$ $\quad a^2-b^2$

$= (m^2)^2 - 4^2$ $\quad a = m^2$, $b = 4$

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

$= (m^2+4)(m^2-2^2)$ $\quad a = m$, $b = 2$

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

#4. $25a^4 - 9y^4$

$= (5a^2)^2 - (3y^2)^2$ $\quad a = 5a^2$, $b = 3y^2$

$= (5a^2+3y^2)(5a^2-3y^2)$

#32 $x^3 + 5x^2 - 6$

Impossible to factor

$ax^2 + bx + c$

x^2: 0 0 / 0 0

$ax^4 + bx^2 + c$

$ac = ax^2 c$

$b = bx^2$

#34. $m^4 - 9m^2 - 112$

$= ax^2 + bx + c$

@ $x = m^2$ $\quad a = m^2$

$= m^4 - 16m^2 + 7m^2 - 112$

m^2 $\quad 7$

$= m^2(m^2-16) + 7(m^2-16)$

$= (m^2-16)(m^2+7) \rightarrow = (m^2+7)(m+4)(m-4)$

m^2 $\quad x = m^2$

$ac = m^2 \times -112 = -112m^2$

$b = -9m$

$-16m \times 7m$

Factoring Review

#5. $3x^2+13x-10$

$ac = 3 \times -10 = -30 = -6 \times 5$ (No)

$b = 13$

$15 \times (-2)$

$= 3x^2+15x-2x-10$

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

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

#15 $(x-2)^2-(x-6)^2$

$a = x-2$

$b = x-6$

$= (x-2+x-6)(x-2-(x-6))$

$= (2x-8)(4)$

$= 4(2x-8)$

$= 8(x-4)$

#1. $4x-4y+8$

$= 4(x-y+2)$

ax^2+bx+c (Yes)

ay^2+by+c (Yes)

ay^2+bx+c (No)