6.3 ① $2x^2 + 7x + 3$ → prod 6. (6)(1)
sum 7.

$2x^2 + 6x + x + 3$

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

$(x+3)(2x+1)$ done

(27) $3x^2 - xy - 14y^2$ prod -42
sum -1
-7(6)

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

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

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

(EX) 37 $24a^2 - 50a + 24$ GCF

prod 576
sum −50

6(96)
12(48)
18(32)

$24a^2 - 18a - 32a + 24$

$6a(4a - 3) - 8(4a - 3)$

$(4a - 3)(6a - 8)$

$2(4a - 3)(3a - 4)$

6.4 (ex) Factor $16x^2 - 25$ conjugates

$(4x - 5)(4x + 5)$

(ex) $288x^2 - 50$

$2(144x^2 - 25)$

$2(12x - 5)(12x + 5)$ done

(ex) $16x^2 + 24x + 9$

$(4x)^2 \quad 3(4x)(2) \quad (3)^2$

$(4x+3)^2$

prod 144 (12)(12)
sum 24

$16x^2 + 12x + 12x + 9$

$4x(4x+3) + 3(4x+3)$

$(4x+3)(4x+3)$ same answer

6.5 Sum and Difference of Two Cubes

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

opp

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

a	a	a^2
b	ab	
b	b	b^2

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

(ex) $a^3 - 8 = (a-2)(a^2+2a+4)$

$a \cdot a = a^2$

$a \cdot 2 = 2a$

$2 \cdot 2 = 4$

(ex) $128a^3 + 2b^3$

$2(64a^3 + b^3)$

$2[(4a)^3 + (b)^3]$

$2(4a+b)(16a^2 - 4ab + b^2)$

$4a \cdot 4a = 16a^2$

$4a \cdot b = 4ab$

$b \cdot b = b^2$

(ex) $x^6 - y^6$

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

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

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

(ex) $2x^2 - 4x + 2$

prod 1 $(-1)(-1)$
sum -2

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

$2(x-1)(x-1)$

$2(x-1)^2$

(ex) $16x^3y^2 - 4xy^2$

$4xy^2(4x^2 - 1)$

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

conjugates

(ex) $8y^2 - 20$

$4(2y^2 - 5)$

(ex) $(a+5)(a-2) + (a+5)(a+1)$

$(a+5)(a-2+a+1)$

$(a+5)(2a-1)$

(ex) $a^3 - 3a^2 + 6 - 2a$

$a^3 - 3a^2 - 2a + 6$

$a^2(a-3) - 2(a-3)$

$(a-3)(a^2-2)$

(ex) $x^2 + 7x + 12$

prod 12 3(4)
sum 7

$(x+3)(x+4)$

(9x) $2x^2 - x - 10$ prod -20 sum -1 $4(-5)$

$2x^2 + 4x - 5x - 10$

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

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

$x^2 - y^2$

$(x-y)(x+y)$ conjugates