

$$(u-v)^3 + v - u$$

$$(u-v)^3 - u + v$$

$$(u-v)^3 - (u-v) \cdot 1$$

$$(u-v)[(u-v)^2 - 1]$$

$$(u-v)[u-v-1][u-v+1]$$

$$a(a^2-9) - 2(a+3)^2$$

$$a(a-3)(a+3) - 2(a+3)(a+3)$$

$$(a+3)[a(a-3) - 2(a+3)]$$

$$(a+3)[a^2 - 3a - 2a - 6]$$

$$(a+3)[a^2 - 5a - 6]$$

$$(a+3)(a-6)(a+1)$$

$$h^2 - 4k^2 + 4h - 8k$$

$$(h-2k)(h+2k) + 4(h-2k)$$

$$(h-2k)[h+2k+4]$$

$$x^4 + 4$$

$$= x^4 + 4x^2 + 4 - 4x^2, \quad 4x^2 + 4x^2 = 0$$

$$= (x^2 + 2)^2 - 4x^2 \quad \text{perfect square trinomial}$$

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

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

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

$$x^4 + 4a^4$$

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

$$(1x^2)^2 + 2 \cdot 2(x^2)a^2 + (2a)^2 - 4x^2a^2$$

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

$$(x^2 + 2a^2 - 2xa)(x^2 + 2a^2 + 2xa)$$

$$a^{2n+1} + b^{2n+1} + a^{2n}b^{2n} + ab$$

$$a^{2n+1} + a^{2n} \cdot b^{2n} + b^{2n+1} + ab$$

$$a^{2n}(a^1 + b^{2n}) + b(b^{2n} + a)$$

$$(a^{2n} + b)(a + b^{2n})$$

$$5 + 7x - 6x^2$$

$$5(-6) = -30 \text{ and}$$

$$10 - 3 = 7$$

$$\text{so } 5 + 10x - 3x - 6x^2$$

$$5(1 + 2x) - 3x(1 + 2x)$$

$$(5 - 3x)(1 + 2x)$$

$$25w^6 - 144x^6$$

$$(5w^3)^2 - (12x^3)^2$$

$$(5w^3 - 12x^3)(5w^3 + 12x^3)$$

$$25a^2 + 20ab + 4b^2$$

$$(5a)^2 + 2 \cdot 5a \cdot 2b + (2b)^2$$

$$(5a + 2b)^2$$

$$(a+b)^4 - (a-b)^4$$

$$((a+b)^2)^2 - [(a-b)^2]^2$$

$$[(a+b)^2 - (a-b)^2][(a+b)^2 + (a-b)^2]$$

$$[(a+b) - (a-b)][(a+b) + (a-b)][(a+b)^2 + (a-b)^2]$$

$$(2b)(2a)[(a+b)^2 + (a-b)^2]$$

$$4ab[(a+b)^2 + (a-b)^2]$$

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

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

$$8ab(a^2 + b^2)$$

$$x^{2n} - 4x^n y^{2n} - 221y^{4n}$$

$$1(-221) = -221$$

$$-17(13)$$

$$x^{2n} + 13x^n y^{2n} - 17x^n y^{2n} - 221y^{4n}$$

$$x^n(x^n + 13y^{2n}) - 17y^{2n}(x^n + 13y^{2n})$$

$$(x^n - 17y^{2n})(x^n + 13y^{2n})$$

$$(y^2 + 3y - 1)^2 - 9 \quad (\text{note } 9 = 3^2)$$

$$[y^2 + 3y - 1 - 3][y^2 + 3y - 1 + 3]$$

$$[y^2 + 3y - 4][y^2 + 3y + 2]$$

$$(y-1)(y+4)(y+1)(y+2)$$

$$8 + 45r - 18r^2 \quad -8(18) = -144$$

$$3 + (-48) = -45$$

$$-1(18r^2 - 45r - 8)$$

$$-1(18r^2 - 48r + 3r - 8)$$

$$-1[6r(3r - 8) + 1(3r - 8)]$$

$$-1[6r + 1][3r - 8]$$

$$9 + 6k - 8k^2$$

$$9(-8) = -72$$

$$72 / 2 = 36$$

$$72 / 3 = 24$$

$$72 / 4 = 18$$

$$72 / 6 = 12$$

$$9 + 12k - 6k - 8k^2$$

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

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

$$2x^4 - 15x^2 - 27$$

$$2(-27) = -54$$

$$-54 / 6 = -9, \quad -54 / 3 = -18$$

$$2x^4 - 18x^2 + 3x^2 - 27$$

$$2x^2(x^2 - 9) + 3(x^2 - 9)$$

$$(2x - 3)(x^2 - 9)$$

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

$$(a+b)^4 - (a-b)^4$$

$$x = a+b, y = a-b$$

$$x^4 - y^4$$

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

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

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

$$[a+b - (a-b)][a+b + (a-b)](x^2 + y^2)$$

$$[2b][2a][(a+b)^2 + (a-b)^2]$$

$$4ab[a^2 + 2ab + b^2 + a^2 - 2ab + b^2]$$

$$4ab[2a^2 + 2b^2]$$

$$8ab[a^2 + b^2]$$