

$$a^2 + a - b^2 - b = (a^2 - b^2) + a - b = (a - b)(a + b) + 1(a - b) = (a - b)(a + b + 1)$$

$$2a^4 - 32 = 2(a^4 - 16) = 2(a^2 - 4)(a^2 + 4) = 2(a - 2)(a + 2)(a^2 + 4)$$

$$a^3b - 27b = b(a^3 - 27) = b(a - 3)(a^2 + 3a + 9)$$

$$7a^5 - 7a^2b^3 = 7a^2(a^3 - b^3) = 7a^2(a - b)(a^2 + ab + b^2)$$

$$2a^2 - 50 = 2(a^2 - 25) = 2(a + 5)(a - 5)$$

$$\frac{16}{25}x^4 - 4x^3y^2 + \frac{25}{4}x^2y^4 = x^2\left(\frac{16}{25}x^2 - 4xy^2 + \frac{25}{4}y^4\right) = x^2\left(\frac{4}{5}x - \frac{5}{2}y^2\right)^2$$

$$a^2 + ab - ay - by = a(a + b) - y(a + b) = (a + b)(a - y)$$

$$a^2 + b^2 + 1 - 2ab - 2a + 2b = (a - b - 1)^2$$

$$a^8 - 2a^4 + 1 = (a^4 - 1)^2 = (a^2 - 1)^2(a^2 + 1)^2 = (a - 1)^2(a + 1)^2(a^2 + 1)^2$$

$$8a^3 - 12a^2b^3 + 6ab^6 - b^9 = (2a - b^3)^3$$

$$x^5 - 2x^4 - x + 2 = x^4(x - 2) - 1(x - 2) = (x - 2)(x^4 - 1) = (x - 2)(x^2 - 1)(x^2 + 1) = (x - 2)(x - 1)(x + 1)(x^2 + 1)$$

$$16y^4 - 4y^2 + 1 = (4y^2 - 1)^2 = (2y - 1)^2(2y + 1)^2$$

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

$$a^4 + 3a^3 - a - 3 = a^3(a + 3) - 1(a + 3) = (a + 3)(a^3 - 1) = (a + 3)(a - 1)(a^2 + a + 1)$$

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

$$a^4 - 4a^2b^2 - 9a^2 + 36b^2 = a^2(a^2 - 4b^2) - 9(a^2 - 4b^2) = (a^2 - 4b^2)(a^2 - 9) = (a - 2b)(a + 2b)(a - 3)(a + 3)$$

$$x^2 - 1 - xy - y = (x - 1)(x + 1) - y(x + 1) = (x + 1)(x - 1 - y)$$

$$a^4 + b^4 + 9 - 2a^2b^2 - 6a^2 + 6b^2 = (a^2 - b^2 - 3)^2$$

$$a^4 - \frac{3}{2}a^3 + \frac{3}{2}a^2 - \frac{a}{8} = a\left(a^3 - \frac{3}{2}a^2 + \frac{3}{2}a - \frac{1}{8}\right) = a\left(a - \frac{1}{2}\right)^3$$

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