

Scomponi in fattori i seguenti polinomi:

$$1. \quad ax^2 - 16a - 2bx^2 + 32b = a(x^2 - 16) - 2b(x^2 - 16) = (x^2 - 16)(a - 2b) = (x - 4)(x + 4)(a - 2b)$$

$$2. \quad abx^2 - bx^2 - ax^2 + x^2 = x^2(ab - b - a + 1) = x^2[b(a - 1) - (a - 1)] = x^2(a - 1)(b - 1)$$

$$3. \quad ax^2 + 2axy + ay^2 - x^2 - 2xy - y^2 = \\ = a(x^2 + 2xy + y^2) - (x^2 + 2xy + y^2) = a(x + y)^2 - (x + y)^2 = (x + y)^2(a - 1)$$

$$4. \quad (a + 1)^2 + 4 - 4(a + 1) = [(a + 1) - 2]^2 = (a - 1)^2$$

$$5. \quad 8a^6 + 12a^4b^5 + 6a^2b^{10} + b^{15} = (2a^2 + b^5)^3$$

$$6. \quad x^3 - 2x^2 - 4x + 8 = x^2(x - 2) - 4(x - 2) = (x - 2)(x^2 - 4) = (x - 2)(x - 2)(x + 2) = (x - 2)^2(x + 2)$$

$$7. \quad x^8 - 256 = (x^4 + 16)(x^4 - 16) = (x^4 + 16)(x^2 + 4)(x^2 - 4) = (x^4 + 16)(x^2 + 4)(x + 2)(x - 2)$$

$$8. \quad 4a^{2n+2} + 9a^2 + 12a^{n+2} = a^2(4a^{2n} + 9 + 12a^n) = a^2(2a^n + 3)^2$$

$$9. \quad x^2 - a^2 + 2ab - b^2 = x^2 - (a^2 - 2ab + b^2) = x^2 - (a - b)^2 = (x + a - b)(x - a + b)$$

$$10. \quad 4a - 4b - ax^2 + bx^2 = 4(a - b) - x^2(a - b) = (a - b)(4 - x^2) = (a - b)(2 - x)(2 + x)$$