

Calcolo letterale

Scomposizione in fattori-02

Sulla differenza di due quadrati

- 1) $a^2 - x^2 = (a - x)(a + x)$
- 2) $a^2 - 4x^2 = (a - 2x)(a + 2x)$
- 3) $x^4 - 4y^2 = (x^2 - 2y)(x^2 + 2y)$
- 4) $x^4 - y^{-2} = (x^2 - y^{-1})(x^2 + y^{-1})$
- 5) $x^6 - 9y^{-2n} = (x^3 - 3y^{-n})(x^3 + 3y^{-n})$
- 6) $4x^{2n} - 9y^{4n+2} = (2x^n - 3y^{2n+1})(2x^n + 3y^{2n+1})$
- 7) $4xy^2 - 36x^3 = 4x(y^2 - 9x^2) = 4x(y - 3x)(y + 3x)$
- 8) $18x^2y - 2x^4y^3 = 2x^2y(9 - x^2y^2) = 2x^2y(3 - xy)(3 + xy)$
- 9) $a^3 - a = a(a^2 - 1) = a(a - 1)(a + 1)$
- 10) $a^9 - 16a = a(a^8 - 16) = a(a^4 + 4)(a^4 - 4) = a(a^4 + 4)(a^2 + 2)(a^2 - 2)$
- 11) $a^3b - 100ab^5 = ab(a^2 - 100b^4) = ab(a - 10b^2)(a + 10b^2)$
- 12) $a^6b - a^2b = a^2b(a^4 - 1) = a^2b(a^2 + 1)(a^2 - 1) = a^2b(a^2 + 1)(a + 1)(a - 1)$
- 13) $a^4b - 9a^2b(a + b)^2 = a^2b[a^2 - 9(a + b)^2] = a^2b[a - 3(a + b)][a + 3(a + b)] =$
 $-a^2b(2a + 3b)(4a + 3b)$
- 14) $40x^2y^4 - 360x^6 = 40x^2(y^4 - 9x^4) = 40x^2(y^2 - 3x^2)(y^2 + 3x^2)$
- 15) $4b^2(a - 1)^2 - b^2(a + 1)^2 = b^2[4(a - 1)^2 - (a + 1)^2] =$
 $b^2[2(a - 1) - (a + 1)][2(a - 1) + (a + 1)] = b^2(a - 3)(3a - 1)$
- 16) $(a - 2b)^4 - (a - 2b)^2(a + 2b)^2 = (a - 2b)^2((a - 2b)^2 - (a + 2b)^2) =$
 $(a - 2b)^2((a - 2b) + (a + 2b))((a - 2b) - (a + 2b)) = -8ab(a - 2b)^2$
- 17) $(a + b)^4(a - b) - (a + b)^2(a - b)^3 = (a + b)^2(a - b)((a + b)^2 - (a - b)^2) =$
 $(a + b)^2(a - b)((a + b) + (a - b))((a + b) - (a - b)) = (a + b)^2(a - b)(2a)(2b) =$
 $4ab(a + b)^2(a - b)$
- 18) $5x^2 - 45x^{4n+2} = 5x^2(1 - 9x^{4n}) = 5x^2(1 - 3x^{2n})(1 + 3x^{2n})$
- 19) $10a - \frac{a^{2n+1}}{10} = 10a\left(1 - \frac{a^{2n}}{100}\right) = 10a\left(1 - \frac{a^n}{10}\right)\left(1 + \frac{a^n}{10}\right)$
- 20) $x^{4n+1} - 16x^3y^{2n} = x(x^{4n} - 16x^2y^{2n}) = x(x^{2n} - 4xy^n)(x^{2n} + 4xy^n)$
- 21) $12x^{2n+3}y - 27xy^{4n+1} = 3xy(4x^{2n+2} - 9y^{4n}) = 3xy(2x^{n+1} - 3y^{2n})(2x^{n+1} + 3y^{2n})$
- 22) $7x^{3n}y^{n-1} - \frac{1}{7}x^n y^{3n+1} = 7x^n y^{n-1}\left(x^{2n} - \frac{1}{49}y^{2n+2}\right) = 7x^n y^{n-1}\left(x^n - \frac{1}{7}y^{n+1}\right)\left(x^n + \frac{1}{7}y^{n+1}\right)$

$$23) 10^n x^5 - 1000^n x^3 = 10^n x^5 - 10^{3n} x^3 = 10^n x^3 (x^2 - 10^{2n}) = 10^n x^3 (x - 10^n)(x + 10^n)$$

$$24) 0,001x^3 - 10x = 10^{-3}x^3 - 10x = 10x(10^{-4}x^2 - 1) = 10x(10^{-2}x - 1)(10^{-2}x + 1)$$

$$25) 10.000 - x^4 = 10^4 - x^4 = (10^2 + x^2)(10^2 - x^2) = (100 + x^2)(10 + x)(10 - x)$$

$$\text{Con } x=1 \rightarrow 9.999=101 \cdot 11 \cdot 9$$

$$26) 12x^{4+n} - 3x^{3n}y^2 = 3x^n(4x^4 - x^{2n}y^2) = 3x^n(2x^2 - x^ny)(2x^2 + x^ny)$$

$$27) 6x^6 - \frac{y^6}{216} = 6\left(x^6 - \frac{y^6}{6^4}\right) = 6\left(x^3 - \frac{y^3}{36}\right)\left(x^3 + \frac{y^3}{36}\right)$$

$$28) 64x^4 - 4x^{4n+4} = 4x^4(16 - x^{4n}) = 4x^4(4 + x^{2n})(2 + x^n)(2 - x^n)$$