

## Espressioni con i polinomi

- 1)  $\left[ -(4)^{-2}x^8 + \frac{1}{4}x^2(3x^2 + 4)(0,75x^4 - x^2) \right] : \left( -\frac{1}{2}x^2 \right)^2 - 4\left( \frac{1}{2}x^4 + 1 \right)$
- 2)  $\left[ \left( -\frac{18}{5} \right)^{-1}x^8 + \frac{1}{3}x^2(2x^2 + 3x)\left( \frac{2}{3}x^4 - x^3 \right) \right] : (-0,25x^3)^2 - \frac{4}{3}(2x^2 - 6)$
- 3)  $\left[ -\left( -\frac{4}{3} \right)^{-2}x^8 + 0,75x^2\left( \frac{1}{3}x^2 + \frac{4}{3} \right)\left( \frac{1}{4}x^4 - x^2 \right) \right] : \left( -\frac{1}{2}x^2 \right)^2 + 2\left( x^4 - \frac{1}{4} \right)$
- 4)  $\left[ -(-2)^{-2}x^8 + 1,25x^2\left( 2x^2 + \frac{4}{5}x \right)\left( \frac{5}{2}x^4 - x^2 \right) \right] : \left( -\frac{1}{3}x^2 \right)^2 - 54\left( x^4 + \frac{1}{9} \right)$

## Espressioni con i prodotti notevoli

Espressioni contenenti quadrati di binomio, somme per differenze, frazioni generatrici, potenze con esponente negativo, operazioni con i polinomi:

- 1)  $\left( \frac{3}{2}x^4 - 3x \right)^2 - (-0,5x^4 - x)\left( x - \frac{1}{2}x^4 \right) - 2x^2\left( x^4 - \frac{9}{2}x \right)(x^3 + x^2) + (-0,1)^{-1}x^2 = [9x^6 - 2x^9]$
- 2)  $\left( \frac{2}{3}x^3 - \frac{1}{2}x^2 \right)^2 - x\left( -0,1 - \frac{1}{3}x^2 \right)\left( -\frac{1}{3}x^2 + \frac{1}{10} \right) - \left( \frac{1}{9}x^4 + \frac{1}{16}x^2 \right)(4x^3 + 4x^2) - (-10)^{-2}x = \left[ -\frac{4}{9}x^7 - \frac{37}{36}x^5 \right]$
- 3)  $\left( -2,5x^5 - \frac{1}{2}x \right)^2 - \left( -\frac{5}{2}x^5 + \frac{1}{2}x \right)\left( -\frac{1}{2}x - \frac{5}{2}x^5 \right) - \frac{1}{2}x(5x^4 + 1)(x^2 + x) - \left( -\frac{2}{5} \right)^{-1}x^7 = \left[ -\frac{1}{2}x^3 \right]$
- 4)  $\left( -1,5x^3 + \frac{1}{3}x^2 \right)^2 - \left( -\frac{3}{2}x^3 - x^2 \right)\left( x^2 - \frac{3}{2}x^3 \right) - \frac{1}{3}x^2(9x^2 + 10x)\left( \frac{1}{3}x^2 + \frac{1}{3}x \right) - (-0,9)^{-1}x^5 = [-x^6]$
- 5)  $\left( \frac{1}{3}x^2 - 2x \right)^2 - \left( -\frac{1}{3}x^2 - 2x \right)\left( 2x - \frac{1}{3}x^2 \right) - 2x(4x - 0,25)\left( \frac{1}{2}x + 1 \right) - (-2)^{-2}x^2 = \left[ \frac{1}{2}x - \frac{16}{3}x^3 \right]$
- 6)  $(0,25x^3 - 3x)^2 - \left( -\frac{1}{4}x^3 - x \right)\left( x - \frac{1}{4}x^3 \right) - \frac{1}{2}x(20 - 3x^2)(x^2 + x) - (-0,1)^{-1}x^3 = \left[ \frac{3}{2}x^5 \right]$
- 7)  $\left( -\frac{2}{3}x^3 - 2x \right)^2 - 4\left( -\frac{1}{3}x^3 - x \right)\left( x - \frac{1}{3}x^3 \right) - 2x\left( 4 - \frac{1}{6}x^2 \right)(x^2 + x) - \left( -\frac{1}{2} \right)^{-3}x^3 = \left[ \frac{1}{3}x^5 + 3x^4 \right]$
- 8)  $\left[ \left( \frac{1}{2}x^2 - x \right)^2 + x^3 \right] (0,25x^4 - x^2) - \frac{1}{2}x^2\left( \frac{1}{8}x^6 - 2x^2 \right)(x+1) + 2^{-4}x^9 = [x^5]$
- 9)  $\left[ \left( \frac{1}{2}x - 3 \right)^2 - 9 \right] (0,25x^2 + 3x) - x^2\left( \frac{1}{16}x^2 - 9 \right)(x+1) + 2^{-4}x^5 = [9x^3]$

Espressioni contenenti anche cubi di binomio:

$$10) \left(\frac{2}{3}x^2 - x\right)^3 - \frac{8}{3}x^2\left(-\frac{1}{3}x^2 - x\right)\left(x - \frac{1}{3}x^2\right) + \frac{1}{2}x(8x^3 + 2x)(x^2 + x) - (-0,5)^{-2}x^6 = \left[\frac{8}{3}x^5 + \frac{17}{3}x^4\right]$$

$$11) \left(\frac{1}{3}x^4 - x^2\right)^3 - \frac{1}{3}x^2\left(\frac{1}{3}x^5 - 3x^4\right)^2 - \frac{1}{3}x^5(3x^3 + 2x^6) - (-2x^{-3})^{-2} = \left[-\frac{10}{3}x^{10} - \frac{5}{4}x^6\right]$$

12)

$$\left(\frac{1}{2}x^3 - x + 2\right)\left(\frac{1}{2}x^3 - x - 2\right) - \left(\frac{1}{2}x^2 - 2x\right)^3 - 2x^2\left(4 + \frac{3}{4}x^2\right)(x - x^2) + \left(-\frac{1}{2}\right)^{-2} = \left[\frac{13}{8}x^6 + x^4 + x^2\right]$$

$$13) \left(\frac{1}{3}x^4 - x^2\right)^3 + \left(\frac{1}{3}x^6 - x^4\right)^2 - \frac{1}{2}x^5(4x^3 - 2x)\left(\frac{1}{2}x^4 + 1\right) - \left(-\frac{27}{23}\right)^{-1}x^{12} = \left[-\frac{1}{2}x^{10}\right]$$

$$14) \left[\left(\frac{1}{3}x^2 - 1\right)^3 - x^2\left(\frac{1}{27}x^4 + 1\right)\right]\left(-\frac{1}{3}x^4 + 1\right) - \left(\frac{1}{9}x^8 - 1\right)(x + 1) + 3^{-2}x^9 = [x]$$

Espressioni contenenti anche divisioni di monomi e di un polinomio per un monomio:

$$15) \frac{1}{8}\left(\frac{2}{3}x^4 - 2x\right)^3 - \frac{1}{12}x^{18} : \left(-\frac{3}{2}x^3\right)^2 - \left[\left(x^3 - \frac{1}{3}\right)^2 - \frac{1}{3}x^9\right] = \left[-\frac{1}{9} - \frac{1}{3}x^3\right]$$

$$16) \frac{8}{27}\left(\frac{1}{2}x^4 - \frac{3}{2}x\right)^3 - \frac{1}{48}x^{20} : \left(-\frac{3}{4}x^4\right)^2 - \left[\left(x^3 - \frac{2}{3}\right)^2 - \frac{1}{3}x^3\right] = \left[-\frac{4}{9} + \frac{2}{3}x^3 - \frac{1}{3}x^9\right]$$

$$17) \left(\frac{1}{3}x^2 - 1\right)^3 - \left(\frac{1}{3}x^3 - \frac{3}{2}x\right)^2 - \left(\frac{1}{3}x^6 - \frac{5}{8}x^4\right) : \frac{1}{2}x^2 = \left[-\frac{2}{27}x^6 - 1\right]$$

$$18) \left[\left(\frac{1}{2}x^2 - x\right)^3 - \frac{1}{4}x^5\left(\frac{1}{2}x - 3\right)\right]\left(-x^3 - \frac{3}{2}x^4\right) - x^6\left(1 - \frac{9}{4}x^2\right)(x + 1) - \left(-\frac{2}{3}\right)^{-2}x^9 = [-x^7]$$