

POLINOMI (parte 3)

Esercizi svolti dall'allieva La Vitola Katia

(classe 1B IPSIA Trebisacce (CS) a.s.2009/2010)

$$\begin{aligned} 13) & \left[(3m^3x^3) \cdot \left(\frac{1}{6}xy - \frac{1}{9}amy - \frac{3}{h}x \right) \cdot \left(\frac{1}{5}xy^3 \right) - \frac{1}{5}m^3x^4y^3 \cdot \left(\frac{1}{2}xy - \frac{1}{3}amy - \frac{9}{h}x \right) \right] = \\ & = \left[\frac{1}{2}m^3x^4y - \frac{1}{3}am^3x^3y - \frac{9}{h}m^3x^4 \right] \cdot \left(\frac{1}{5}xy^3 \right) - \frac{1}{10}m^3x^5y^4 + \frac{1}{15}am^3x^4y^4 + \frac{9}{20}m^3x^5y^3 = \\ & = \frac{1}{10}m^3x^5y^4 - \frac{1}{15}am^3x^4y^4 - \frac{9}{20}m^3x^5y^3 - \frac{1}{10}m^3x^5y^4 + \frac{1}{15}am^3x^4y^4 + \frac{9}{20}m^3x^5y^3 = \\ & = 0. \end{aligned}$$

$$\begin{aligned} 14) & 2xy^2 \cdot (x^2 - 2xy - 3y^2) - xy \cdot (x^2y - 4xy^2 - 6y^3) = \\ & = 2x^3y^2 - 4x^2y^3 - 6xy^4 - x^3y^2 + 4x^2y^3 + 6xy^4 = \\ & = x^3y^2. \end{aligned}$$

$$\begin{aligned} 21) & \frac{2}{3}x \cdot \left(\frac{1}{2}x - \frac{3}{2}y \right) - \frac{1}{2}y \cdot \left(2x - \frac{1}{3}y \right) - \frac{2}{3} \cdot \left(\frac{1}{h}y^2 - 3xy + \frac{1}{2}x^2 \right) = \\ & = \frac{1}{3}x^2 - xy - xy + \frac{1}{6}y^2 - \frac{1}{6}y^2 + 2xy - \frac{1}{3}x^2 = 0. \end{aligned}$$

$$\begin{aligned} 25) & (a+b) \cdot (2a-3b) + (4a-b) \cdot (a-5b) + (a-2b) \cdot (a-11b) + 35ab = \\ & = 2a^2 - 3ab + 2ab - 3b^2 + 4a^2 - 20ab - ab + 5b^2 + a^2 - 11ab - 2ab + \\ & \quad + 22b^2 + 35ab = \\ & = 7a^2 + 24b^2. \end{aligned}$$

$$\begin{aligned} 29) & a \cdot \left\{ 5a - [4ab - (1 + 2ab - 3a) - (ab - 5)] \right\} - 2a \cdot (a - 2ab - 2) - \left\{ -[(-a)^2] \right\}^2 = \\ & = a \cdot \left\{ 5a - [4ab - 1 - 2ab + 3a - ab + 5] \right\} - 2a^2 + 4a^2b + 4a - \left\{ -[+(a^2)] \right\}^2 = \\ & = a \cdot \left\{ 5a - [4ab - 1 + 3a + 5] \right\} - 2a^2 + 4a^2b + 4a - \left\{ -[a^2] \right\}^2 = \\ & = a \cdot \left\{ 5a - 4ab + 1 - 3a - 5 \right\} - 2a^2 + 4a^2b + 4a - \left\{ -[a^2] \right\}^2 = \\ & = a \cdot \left\{ +2a - 4ab + 1 - 5 \right\} - 2a^2 + 4a^2b + 4a - \left\{ +a^4 \right\}^2 = \end{aligned}$$

$$= \cancel{2a^2} - \cancel{4a^2b} + \cancel{a} - \cancel{5a} - \cancel{2a^2} + \cancel{4a^2b} + \cancel{4a} - \cancel{a^2} = -a^2$$

$$33) (-a+3) \cdot (b-3) = \quad (-a+1) \cdot (a-4) =$$

$$= -ab + 3a + 3b - 9$$

$$= -a^2 + 4a + a - 4 =$$

$$= -a^2 + 5a - 4$$

$$(4x-3y) \cdot (2x+3y) =$$

$$= 8x^2 + 12xy - 6xy - 9y^2 =$$

$$= 8x^2 + 6xy - 9y^2$$

$$(-6x-4y) \cdot (5x-3y) =$$

$$= -30x^2 + 18xy - 20xy + 12y^2 =$$

$$= -30x^2 - 2xy + 12y^2$$

$$37) (ab+ac+bc) \cdot (a-b+c) =$$

$$= a^2b - ab^2 + abc + a^2c - abc + ac^2 + abc - b^2c + bc^2 =$$

$$= a^2b - ab^2 + a^2c + ac^2 + abc - b^2c + bc^2$$

$$41) (1-x+x^4-x^5) \cdot (1+x+x^2+x^3) =$$

$$= 1 + \cancel{x} + \cancel{x^2} + \cancel{x^3} - \cancel{x} - \cancel{x^2} - \cancel{x^3} - \cancel{x^4} + \cancel{x^4} + \cancel{x^5} + \cancel{x^6} + \cancel{x^7} - \cancel{x^5} - \cancel{x^6} - \cancel{x^7} - \cancel{x^8} =$$

$$= 1 - x^8$$

$$45) (2a-5b) \cdot (3a+4b) - (a+2b) \cdot (6a-10b) + 9ab =$$

$$= 6a^2 + 8ab - 15ab - 20b^2 - (6a^2 - 10ab + 12ab - 20b^2) + 9ab =$$

$$= 6a^2 + 8ab - 15ab - 20b^2 - 6a^2 + 10ab - 12ab + 20b^2 + 9ab =$$

$$= 0$$

$$(x+2y) \cdot (3x-y) - (3x+y) \cdot (2x-y) - 3x \cdot (2y-x) =$$

$$= 3x^2 - xy + 6xy - 2y^2 - (6x^2 - 3xy + 2xy - y^2) - 6xy + 3x^2 =$$

$$= 3x^2 - xy + 6xy - 2y^2 - (6x^2 - xy - y^2) - 6xy + 3x^2 =$$

$$= \cancel{3x^2} - \cancel{xy} + \cancel{6xy} - 2y^2 - \cancel{6x^2} + \cancel{xy} + y^2 - \cancel{6xy} + \cancel{3x^2} =$$

$$= -y^2$$

$$48) \left(\frac{1}{2}a - 3b\right) \cdot \left(2a + \frac{1}{3}b\right) - \left(\frac{1}{3}a - 2b\right) \cdot \left(3a + \frac{1}{2}b\right) =$$

$$= a^2 + \frac{1}{6}ab - 6ab - b^2 - \left(a^2 + \frac{1}{6}ab - 6ab - b^2\right) =$$

$$= \cancel{a^2} + \cancel{\frac{1}{6}ab} - \cancel{6ab} - \cancel{b^2} - \cancel{a^2} - \cancel{\frac{1}{6}ab} + \cancel{6ab} + \cancel{b^2} = 0 -$$

$$53) a^2 \cdot (b-c) - b^2 \cdot (a-c) + c^2 \cdot (a-b) - (a-b) \cdot (b-c) \cdot (a-c) =$$

$$= a^2b - a^2c - ab^2 + b^2c + ac^2 - bc^2 - (ab - ac - b^2 + bc) \cdot (a-c) =$$

$$= a^2b - a^2c - ab^2 + b^2c + ac^2 - bc^2 - (a^2b - abc - a^2c + ac^2 - ab^2 + b^2c + abc - bc^2) =$$

$$= \cancel{a^2b} - \cancel{a^2c} - \cancel{ab^2} + \cancel{b^2c} + \cancel{ac^2} - \cancel{bc^2} - \cancel{a^2b} + \cancel{abc} + \cancel{a^2c} - \cancel{ac^2} + \cancel{ab^2} - \cancel{b^2c} - \cancel{abc} + \cancel{bc^2} =$$

$$= 0 -$$

$$54) \left[a \cdot (b+c) \cdot (b+c-a) + b \cdot (a+c) \cdot (a+c-b) + c \cdot (a+b) \cdot (a+b-c) \right] \cdot x =$$

$$= \left[a \cdot (b^2 + bc - ab + bc + c^2 - ac) + b \cdot (a^2 + ac - ab + ac + c^2 - bc) + c \cdot (a^2 + ab - ac + ab + b^2 - bc) \right] \cdot x =$$

$$= \left[ab^2 + abc - a^2b + abc + ac^2 - a^2c + a^2b + abc - ab^2 + abc + bc^2 - b^2c + a^2c + abc - ac^2 + abc + b^2c - bc^2 \right] \cdot x =$$

$$= \cancel{ab^2}x + \cancel{abc}x - \cancel{a^2b}x + \cancel{abc}x + \cancel{ac^2}x - \cancel{a^2c}x + \cancel{a^2b}x + \cancel{abc}x - \cancel{ab^2}x + \cancel{abc}x + \cancel{bc^2}x - \cancel{b^2c}x + \cancel{a^2c}x + \cancel{abc}x - \cancel{ac^2}x + \cancel{abc}x + \cancel{b^2c}x - \cancel{bc^2}x =$$

$$= 6abcx -$$

$$\begin{aligned}
 110) & (3xy - x^2) \cdot (2y - y^2) + x^2y^2 + x^2y \cdot (2 - y) - xy^2 \cdot (x - 3y) = \\
 & = 6xy^2 - 3xy^3 - 2x^2y + x^2y^2 + x^2y^2 + 2x^2y - x^2y^2 - x^2y^2 + 3xy^3 = \\
 & = 6xy^2 -
 \end{aligned}$$

$$\begin{aligned}
 111) & a \cdot (a - b) \cdot (2a - 3b) + 3b \cdot (a^2 - ab) + a \cdot (2ab - 3b^2) + 3ab^2 = \\
 & = a \cdot (2a^2 - 3ab - 2ab + 3b^2) + 3a^2b - 3ab^2 + 2a^2b - 3ab^2 + 3ab^2 = \\
 & = 2a^3 - 3a^2b - 2a^2b + 3ab^2 + 3a^2b - 3ab^2 + 2a^2b - 3ab^2 + 3ab^2 = \\
 & = 2a^3 -
 \end{aligned}$$

$$\begin{aligned}
 112) & (9x - 5y) \cdot (x + 2y - 3) - (3x - 5y) \cdot (3x - y - 3) + 3 \cdot (6x + 5y^2) = \\
 & = 9x^2 + 18xy - 27x - 5xy - 10y^2 + 15y - (9x^2 - 3xy - 9x - 15xy + 5y^2 + \\
 & \quad + 15y) + 18x + 15y^2 = \\
 & = 9x^2 + 18xy - 27x - 5xy - 10y^2 + 15y - 9x^2 + 3xy + 9x + 15xy + \\
 & \quad - 5y^2 - 15y + 18x + 15y^2 = \\
 & = 31xy -
 \end{aligned}$$

$$\begin{aligned}
 113) & (3a - b) \cdot (2b - 5a) - (7a + b) \cdot (3a - 2b) + (a - 3b) \cdot (5b - a) + 15b^2 + 37a^2 = \\
 & = 6ab - 15a^2 - 2b^2 + 5ab - (21a^2 - 14ab + 3ab - 2b^2) + 5ab - a^2 - 15b^2 + \\
 & \quad + 3ab + 15b^2 + 37a^2 = \\
 & = 6ab - 15a^2 - 2b^2 + 5ab - 21a^2 + 14ab - 3ab + 2b^2 + 5ab - a^2 + \\
 & \quad - 15b^2 + 3ab + 15b^2 + 37a^2 = \\
 & = 30ab -
 \end{aligned}$$

$$114) (a-2) \cdot (a^2 - 2a + 3) - a \cdot (a^2 + 1) + 10 =$$

$$= \cancel{a^3} - 2a^2 + 5a - \cancel{2a^2} + 4a - \cancel{10} - \cancel{a^3} - a + \cancel{10} =$$

$$= -4a^2 + 8a -$$

$$115) x \cdot (y-1) \cdot (x+x^2y^2) + x^3y^2 \cdot (1-y) =$$

$$= x \cdot (xy + x^2y^3 - x - x^2y^2) + x^3y^2 - x^3y^3 =$$

$$= x^2y + \cancel{x^3y^3} - x^2 - \cancel{x^3y^2} + \cancel{x^3y^2} - \cancel{x^3y^3} =$$

$$= x^2y - x^2 -$$

$$116) xy \cdot (2y-1) \cdot (y+3) - 2xy^2 \cdot (3+y) - 3x \cdot (2y^2-y) + 6xy^2 =$$

$$= xy \cdot (2y^2 + 6y - y - 3) - 6xy^2 - 2xy^3 - 6xy^2 + 3xy + 6xy^2 =$$

$$= \cancel{2xy^3} + \cancel{6xy^2} - xy^2 - \cancel{3xy} - \cancel{6xy^2} - \cancel{2xy^3} - \cancel{6xy^2} + \cancel{3xy} + \cancel{6xy^2} =$$

$$= -xy^2 -$$

$$117) 6a^3b + (1-3ab) \cdot (b-a) \cdot (a+b) - 3ab \cdot (a^2-b^2) - 2a^2 \cdot (3ab-1) =$$

$$= 6a^3b + (1-3ab) \cdot (ab + b^2 - a^2 - ab) - 3a^3b + 3ab^3 + 6a^3b + 2a^2 =$$

$$= \cancel{6a^3b} + \cancel{ab} + b^2 - \cancel{a^2} - \cancel{ab} - \cancel{3a^2b^2} - \cancel{3a^3b} + \cancel{3a^3b} + \cancel{3a^2b^2} - \cancel{3a^3b} + \cancel{3ab^3} - \cancel{6a^3b} + 2a^2 =$$

$$= +b^2 + a^2$$

$$\begin{aligned}
 118) & 3x \cdot (xy+1) - (x^2y+1) \cdot 3 + (x-2) \cdot (x^2y+x) + (2-x) \cdot (1+x^2y) = \\
 & = 3x^2y + 3x - (3x^2y + 3) + x^3y + x^2 - 2x^2y - 2x + 2 + 2x^2y - x - x^3y = \\
 & = \cancel{3x^2y} + \cancel{3x} - \cancel{3x^2y} - 3 + \cancel{x^3y} + x^2 - \cancel{2x^2y} - \cancel{2x} + 2 + \cancel{2x^2y} - \cancel{x} - \cancel{x^3y} = \\
 & = -1 + x^2
 \end{aligned}$$

$$\begin{aligned}
 119) & b \cdot (b-2) \cdot (a+3) + 2ab + 6b - (a+2) \cdot (b^2-b) - 2b \cdot (a+2) = \\
 & = b \cdot (ab + 3b - 2a - 6) + 2ab - 6b - (ab^2 - ab + 2b^2 - 2b) + 2ab - 4b = \\
 & = \cancel{ab^2} + 3b^2 - 2ab - 6b + 2ab - 6b - \cancel{ab^2} + ab - 2b^2 + 2b - 2ab - 4b = \\
 & = +b^2 - ab - 14b
 \end{aligned}$$

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