POLINOMI *(parte 2)*

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

51) $(a+b-c)\cdot(a-b)-(a-b-c)\cdot(b-c)+(a-b+c)\cdot(c-a)=$

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

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

$=0$.

55) $\left(\frac{3}{2}ab^2-\frac{1}{5}a^2b\right)\cdot\left(2a+\frac{20}{3}b\right)-ab\cdot\left(10b^2-\frac{2}{5}a^2\right)+\frac{1}{3}a^2b^2=$

$=3a^2b^2\cancel{+10ab^3}\cancel{-\frac{2}{5}a^3b}-\frac{4}{3}a^2b^2\cancel{-10ab^3}\cancel{+\frac{2}{5}a^3b}+\frac{1}{3}a^2b^2=$

$=\left(\frac{9+1-4}{3}\right)a^2b^2=$

$=\frac{\cancel{6}}{\cancel{3}}a^2b^2=2\,a^2b^2$.

12) $3pq^2-[pq\cdot(3p+q)-3p^2\cdot(p+q)]-p\cdot(3p^2+2q^2)=$

$=3pq^2-[\cancel{3p^2q}+pq^2-3p^3-\cancel{3p^2q}]-3p^3-2pq^2=$

$=\cancel{3pq^2}-\cancel{pq^2}+\cancel{3p^3}-\cancel{3p^3}-\cancel{2pq^2}=0.$

16) $2xy\cdot(x+\frac{1}{2}y)+(x^3-y^3)-(2x^2y+xy^2)-x^2\cdot(x-y)+y\cdot(y^2-x^2)=$

$=\cancel{2x^2y}+\cancel{xy^2}+\cancel{x^3}-\cancel{y^3}-\cancel{2x^2y}-\cancel{xy^2}-\cancel{x^3}+\cancel{x^2y}+\cancel{y^3}-\cancel{x^2y}=0.$

20) $6\cdot(ax+3x^2+4x^3)-3x^2\cdot(a+9+13x)+5x\cdot(a+2x+3x^2)+x^2\cdot(3a-1)=$

$=6ax+\cancel{18x^2}+\cancel{24x^3}-\cancel{3ax^2}-\cancel{27x^2}-\cancel{39x^3}+5ax+\cancel{10x^2}+\cancel{15x^3}+\cancel{3ax^2}-\cancel{x^2}=$

$=11ax.$

24) $3x^3\cdot[4x^4-7x\cdot(9x^3-11x^2)+59x^3\cdot(x-1)]+2\cdot(-3x^2)^3=$

$=3x^3\cdot[\cancel{4x^4}-\cancel{63x^4}+77x^3+\cancel{59x^4}-59x^3]+2\cdot(-27x^6)=$

$=3x^3\cdot[+18x^3]-54x^6=$

$=\cancel{54x^6}-\cancel{54x^6}=0.$

28) $6x^3-\{-[y\cdot(-4y^2+x^2)-x^2\cdot(-3x+4y)]-y\cdot(2y^2-5x^2)\}+2y\cdot(4x^2+y^2)=$

$=6x^3-\{-[-4y^3+x^2y+3x^3-4x^2y]-2y^3+5x^2y\}+8x^2y+2y^3=$

$=6x^3-\{-[-4y^3-3x^2y+3x^3]-2y^3+5x^2y\}+8x^2y+2y^3=$

$=6x^3-\{+4y^3+3x^2y-3x^3-2y^3+5x^2y\}+8x^2y+2y^3=$

$=6x^3-\{+2y^3+8x^2y-3x^3\}+8x^2y+2y^3=$

$=6x^3-\cancel{2y^3}-\cancel{8x^2y}+3x^3+\cancel{8x^2y}+\cancel{2y^3}=9x^3.$

32) $(x-1)\cdot(x+2)=$

$=x^2+2x-x-2=$

$=x^2+x-2.$

$(a+1)\cdot(a-3)=$

$=a^2-3a+a-3=$

$=a^2-2a-3.$

$(-a-1)\cdot(a+b)=$

$=-a^2-ab-a-b.$

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

$=x^6-3x^4+2x^3-2x^4+6x^2-4x+x^3-3x+2=$

$=x^6-5x^4+3x^3+6x^2-7x+2.$

$(2a+3b-c)\cdot(b+2a+c)=$

$=2ab+4a^2+\cancel{2ac}+3b^2+6ab+3bc-bc-\cancel{2ac}-c^2=$

$=8ab+4a^2+3b^2+2bc-c^2.$

40) $(a+b)\cdot(a^2+b^2)\cdot(a-b)\cdot(a^4+b^4)\cdot(a^8+b^8)=$

$=a^{16}-b^{16}.$

44) $(x^{n-1}-x^{n-2}y+x^{n-3}y^2-x^{n-4}y^3+x^{n-5}y^4)\cdot(x+y)=$

$=x^{n\cancel{-1}\cancel{+1}}-x^{n-2+1}y+x^{n-3+1}y^2-x^{n-4+1}y^3+x^{n-5+1}y^4+x^{n-1}y-x^{n-2}y^2+$
$+x^{n-3}y^3-x^{n-4}y^4+x^{n-5}y^5=$

$=x^n-x^{n-1}y+x^{n-2}y^2-x^{n-3}y^3+x^{n-4}y^4+x^{n-1}y-x^{n-2}y^2+x^{n-3}y^3+$
$-x^{n-4}y^4+x^{n-5}y^5=$

$=x^n+x^{n-5}y^5.$

48) $(3a+2b)\cdot(4a-6b)-(2a-b)\cdot(6a+8b)+4b\cdot(5a+b)=$

$=12a^2-18ab+8ab-12b^2-(12a^2+16ab-6ab-8b^2)+20ab+4b^2=$

$=\cancel{12a^2}-\cancel{18ab}+\cancel{8ab}-\cancel{12b^2}-\cancel{12a^2}-\cancel{16ab}+\cancel{6ab}+\cancel{8b^2}+\cancel{20ab}+\cancel{4b^2}=$

$=0.$

52) $(a+b+c)\cdot(ab+bc+ca)-(a+b)\cdot(b+c)\cdot(c+a)=$

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

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

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

$=abc.$

56) $(a-c)\cdot[a\cdot(a-b)-c\cdot(b+c)]-b\cdot(a-b)\cdot(b+c)-(a^2-b^2-c^2)\cdot(a-b-c)=$

$=(a-c)\cdot[a^2-ab-bc-c^2]-b\cdot(ab+ac-b^2-bc)-(a^3-a^2b-a^2c-ab^2+b^3$
$+b^2c-ac^2+bc^2+c^3)=$

$=(a-c)\cdot[a^2-ab-bc-c^2]-ab^2-abc+b^3+b^2c-a^3+a^2b+a^2c+ab^2-b^3+$
$-b^2c+ac^2-bc^2-c^3=$

$=\cancel{a^3}-\cancel{a^2b}-\cancel{abc}-\cancel{ac^2}-\cancel{a^2c}+abc+\cancel{bc^2}+\cancel{c^3}-\cancel{ab^2}-abc+\cancel{b^3}+b^2c+$
$-\cancel{a^3}+\cancel{a^2b}+\cancel{a^2c}+\cancel{ab^2}-\cancel{b^3}-\cancel{b^2c}+\cancel{ac^2}-\cancel{bc^2}-\cancel{c^3}=$

$=-abc.$

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