POLINOMI *(parte 1)*

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

10) $4x^3-\{2xy\cdot(2x-3y)-[2x^2\cdot(2y-3x)+2x\cdot(x^2-3y^2)]\}=$

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

$=4x^3-\{4x^2y-6xy^2-[4x^2y-4x^3-6xy^2]\}=$

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

$=4x^3-\{+4x^3\}=$

$=4x^3-4x^3=0.$

14) $-\frac{2}{5}a^{n+2}b^3\cdot(7a^m-3a^{m-1}b+2a^{m-2}b^n-5)=$

$=-\frac{14}{5}a^{m+n+2}b^3+\frac{6}{5}a^{m+n+2-1}b^n-\frac{4}{5}a^{m+n+2-2}b^{n+3}+2a^{n+2}b^3=$

$=-\frac{14}{5}a^{m+n+2}b^3+\frac{6}{5}a^{m+n+1}b^n-\frac{4}{5}a^{m+n}b^{n+3}+2a^{n+2}b^3.$

18) $2ab\cdot(3a-2b)-3b^2\cdot(a+b)-b\cdot(18a^2-3b^2)+7ab\cdot(2a+b)=$

$=18a^2b-4ab^2-3ab^2-3b^3-18a^2b+3b^3+14a^2b+7ab^2=$

$=14a^2b.$

22) $x\cdot(x-y)-y\cdot(x-y)+2xy-(a^2-b^2)+a\cdot(a+b)-b\cdot(a+b)=$

$=x^2-xy-xy+y^2+2xy-a^2+b^2+a^2+ab-ab-b^2=$

$=x^2+y^2.$

26) $\frac{a}{3}\cdot(2x-a)\cdot(x-a)-\frac{2}{3}a\cdot(x^2+2a^2)+a^2\cdot(x+a)=$

$=\frac{a}{3}\cdot(2x^2-2ax-ax+a^2)-\frac{2}{3}ax^2-\frac{4}{3}a^3+a^2x+a^3=$

$=\frac{2}{3}ax^2-\frac{2}{3}a^2x-\frac{1}{3}a^2x+\frac{1}{3}a^3-\frac{2}{3}ax^2-\frac{4}{3}a^3+a^2x+a^3=$

$=\frac{-2-1+3}{3}a^2x+\frac{1-4+3}{3}a^3=0.$

30) $x^2\cdot(y^2-12)-2x\cdot\left\{\frac{3}{4}y+2x\cdot\left[-3-\frac{1}{2}y\cdot\left(3x-\frac{1}{2}y\right)\right]+3x^2y\right\}+\frac{3}{2}xy=$

$=x^2y^2-12x^2-2x\cdot\left\{\frac{3}{4}y+2x\cdot\left[-3-\frac{3}{2}xy+\frac{1}{4}y^2\right]+3x^2y\right\}+\frac{3}{2}xy=$

$=x^2y^2-12x^2-2x\cdot\left\{\frac{3}{4}y-6x-3x^2y+\frac{1}{2}xy^2+3x^2y\right\}+\frac{3}{2}xy=$

$=x^2y^2-12x^2-\frac{3}{2}xy+12x^2-x^2y^2+\frac{3}{2}xy=0.$

34) $(3a-4b)\cdot(a-b)=$

$=3a^2-3ab-4ab+4b^2=$

$=3a^2-7ab+4b^2.$

$(4b-5c)\cdot(3b+4c)=$

$=12b^2+16bc-15bc-20c^2=$

$=12b^2+bc-20c^2.$

38) $(a-m)\cdot(a^5+a^4m+a^3m^2+a^2m^3+am^4+m^5)=$

$=a^6+a^5m+a^4m^2+a^3m^3+a^2m^4+am^5-a^5m-a^4m^2-a^3m^3-a^2m^4-am^5-m^6=$

$=a^6-m^6.$

42) $(a^m+2a^{m+1}-3a^{m+2}-1)\cdot(a+1)=$

$=a^{m+1}+2a^{m+2}-3a^{m+3}-a+a^m+2a^{m+1}-3a^{m+2}-1=$

$=3a^{m+1}-a^{m+2}-3a^{m+3}-a+a^m-1.$

46) $4y^2+(3x+2y)\cdot(4x-6y)-(2x-y)\cdot(6x+8y)+20xy=$

$=4y^2+12x^2-18xy+8xy-12y^2-(12x^2+16xy-6xy-8y^2)+20xy=$

$=4y^2+12x^2-18xy+8xy-12y^2-(12x^2+10xy-8y^2)+20xy=$

$=4y^2+12x^2-18xy+8xy-12y^2-12x^2-10xy+8y^2+20xy=0.$

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

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

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

$=2a^2+2b^2-2c^2.$

54) $(a+b)\cdot[(a-2b)\cdot(2a+b)+3b\cdot(a+b)-a^2]-(a^2+b^2)\cdot(a+b)=$

$=(a+b)\cdot[2a^2+ab-4ab-2b^2+3ab+3b^2-a^2]-(a^3+a^2b+ab^2+b^3)=$

$=(a+b)\cdot[2a^2+ab-4ab-2b^2+3ab+3b^2-a^2]-a^3-a^2b-ab^2-b^3=$

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

$=a^3+ab^2+a^2b+b^3-a^3-a^2b-ab^2-b^3=0.$

58) $[2x-x\cdot(x^2-x+1)]\cdot(x^2+x)-x\cdot[1+x\cdot(1+2x)]+x\cdot(x^4+1)=$

$=[2x-x^3+x^2-x]\cdot(x^2+x)-x\cdot[1+x+2x^2]+x^5+x=$

$=2x^3+2x^2-x^5-x^4+x^4+x^3-x^3-x^2-x-x^2-2x^3+x^5+x=0.$

11) $3a^2b - \{2a \cdot (a^2 - 2b^2) - [3a^2 \cdot (a+2b) - a^2 \cdot (3b+a)]\} =$

$= 3a^2b - \{2a^3 - 4ab^2 - [3a^3 + 6a^2b - 3a^2b - a^3]\} =$

$= 3a^2b - \{2a^3 - 4ab^2 - 3a^3 - 6a^2b + 3a^2b + a^3\} =$

$= 3a^2b - 2a^3 + 4ab^2 + 3a^3 + 6a^2b - 3a^2b - a^3 = 4ab^2.$

15) $2ab^2 \cdot (a^2 - 2ab - 3b^2) - ab \cdot (a^2b - 4ab^2 - 6b^3) =$

$= 2a^3b^2 - 4a^2b^3 - 6ab^4 - a^3b^2 + 4a^2b^3 + 6ab^4 = a^3b^2.$

19) $3a \cdot (a - 2b) - 4b \cdot (2a - b) - 2 \cdot (a^2 + 2b^2) - a^2 + 2ab \cdot (6a^2 + 4ab + 10b^2) - 4ab \cdot (5b^2 + 2ab + 3a^2) =$

$= 3a^2 - 6ab - 8ab + 4b^2 - 2a^2 - 4b^2 - a^2 + 12a^3b + 8a^2b^2 + 20ab^3 + -20ab^3 - 8a^2b^2 - 12a^3b =$

$= -14ab.$

23) $(2a + 3b) \cdot a - 2b \cdot (2a + 3b) - (8b^2 + ab) - a^2 + b \cdot (2a + 3b) =$

$= 2a^2 + 3ab - 4ab - 6b^2 - 8b^2 - ab - a^2 + 2ab + 3b^2 =$

$= a^2 - 11b^2.$

27) $(-3a) \cdot [a \cdot (a + b - c) + b \cdot (-a + b + c) + c \cdot (a - b + c) + a^2 - b^2 - c^2 + (-2a^2)] =$

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

$= -3a^3 - 3a^2b + 3a^2c + 3a^2b - 3ab^2 - 3abc - 3a^2c + 3abc - 3ac^2 - 3a^3 + 3ab^2 + 3ac^2 + 6a^3$

$= 0$

31) $(2a+3b)\cdot(a-2b)=$

$=2a^2-4ab+3ab-6b^2=$

$=2a^2-ab-6b^2$.

$(a-4x)\cdot\left(\frac{1}{2}a+3x\right)=$

$=\frac{1}{2}a^2+3ax-2ax-12x^2=$

$=\frac{1}{2}a^2+ax-12x^2$.

35) $(x+a)\cdot(y+b)=$

$=xy+bx+ay+ab$.

$(2m+ab)\cdot(2ab-m)=$

$=4abm-2m^2+2a^2b^2-abm=$

$=3abm-2m^2+2a^2b^2$.

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

$=x^5+x^4+x^3+x^2+x-x^4-x^3-x^2-x-1=$

$=x^5-1$.

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

$=x^5-x^4+x^3-x^2+x+x^4-x^3+x^2-x+1=$

$=x^5+1$.

43) $(a^n-4a^{n-1}+5a^{n-2}+a^{n-3})\cdot(a-1)=$

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

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

$=a^{n+1}-5a^n+8a^{n-1}-4a^{n-2}-a^{n-3}$.

47) $(2x-3y)\cdot(x+4y)-(3x-2y)\cdot(4x+6y)+5x\cdot(2x+y)=$

$=2x^2+8xy-3xy-12y^2-(12x^2+18xy-8xy-12y^2)+10x^2+5xy=$

$=2x^2+8xy-3xy-12y^2-12x^2-18xy+8xy+12y^2+10x^2+5xy=$

$=0$.

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