CORREZIONE VERIFICA 3 (fattorizzazione)

1) $4b^3-12b^2-b+3=4b^2(b-3)-(b-3)=(b-3)(4b^2-1)=(b-3)(2b+1)(2b-1)$

2) $125a^6-a^3=a^3(125a^3-1)=a^3(5a-1)(25a^2+5a+1)$

3) $8x^6-63x^3-8=8x^6-64x^3+x^3-8=8x^3(x^3-8)+(x^3-8)=$

$=(x^3-8)(8x^3+1)=(x-2)(x^2+2x+4)(2x+1)(4x^2-2x+1)$

4) $b^8-b^5-b^4+b=b(b^7-b^4-b^3+1)=b\left[b^4(b^3-1)-(b^3-1)\right]=b(b^3-1)(b^4-1)=$

$=b(b-1)(b^2+b+1)(b^2+1)(b+1)(b-1)=b(b-1)^2(b^2+b+1)(b^2+1)(b+1)$

5) $y^4+5y^2+4=(y^2+1)(y^2+4)$

6) $y^4+4y^2+4=(y^2+2)^2$

7) $y^4+3y^2+4=y^4+4y^2-y^2+4=(y^2+2)^2-y^2=(y^2+2+y)(y^2+2-y)=$

$=(y^2+y+2)(y^2-y+2)$

8) $x^5+xy+y+1=x^5+1+xy+y=(x+1)(x^4-x^3+x^2-x+1)+y(x+1)=$

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

9) $x^3-7x^2+16x-12$

Col metodo di Ruffini:

Divisori del T. N. : $\pm1 \quad \pm2 \quad \pm3 \quad \pm4 \quad \pm6 \quad \pm12$

Divisori del 1° COEFF. : ±1

Possibili zeri razionali: $\pm1 \quad \pm2 \quad \pm3 \quad \pm4 \quad \pm6 \quad \pm12$

$P(1)=1-7+16-12=-2\neq0;$

$P(-1)=-1-7-16-12\neq0;$

$P(2)=8-28+32-12=0,\quad OK$

$(x^3-7x^2+16x-12):(x-2)$

	1	−7	16	−12
2		2	−10	12
	1	−5	6	0

$x^3-7x^2+16x-12=(x^2-5x+6)(x-2)=(x-2)(x-3)(x-2)=(x-2)^2(x-3)$

10) $x^3-x^2y+2y^3$

Ruffini con 2 lettere!

$x^3-x^2y+2y^3$

$P(y)=\cancel{y^3}\ \cancel{-y^2}\cdot y+2y^3\neq0;$

$P(-y)=(-y)^3-(-y)^2\cdot y+2y^3=-y^3-y^3+2y^3=0,\quad OK$

$(x^3-x^2y+2y^3):(x+y)$

	1	$-y$	0	$2y^3$
$-y$		$-y$	$2y^2$	$-2y^3$
	1	$-2y$	$2y^2$	0

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

Volendo, si poteva evitare Ruffini se si scriveva:

$x^3-x^2y+2y^3=$

$=x^3-x^2y+y^3+y^3=$

$=x^3+y^3-x^2y+y^3=$

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

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

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

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