23 Να παραγοντοποιήσετε τις παραστάσεις:

α) $x^2y^2 - 4y^2 - x^2 + 4$

β) $x^4 - 1 + x^3 - x$

γ) $x^3(x^2 - 1) + 1 - x^2$

δ) $(x^2 + 9)^2 - 36x^2$

ε) $\alpha^2 - 2\alpha\beta + \beta^2 - \alpha + \beta$

στ) $x^2 - 2xy + y^2 - \omega^2$

ζ) $1 - \alpha^2 + 2\alpha\beta - \beta^2$

η) $y^2 - x^2 - 10y + 25$

θ) $2(x - 1)(x^2 - 4) - 5(x - 1)(x - 2)^2$

ι) $(y^2 - 4)^2 - (y + 2)^2$

ια) $(\alpha^2 + \beta^2 - y^2)^2 - 4\alpha^2\beta^2$

ιβ) $(x^2 + 9)(\alpha^2 + 4) - (\alpha x + 6)^2$

α) $x^2y^2 - 4y^2 - x^2 + 4 =$

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

$y^2(x^2 - 4) - (x^2 - 4) =$

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

$(x^2 - 2^2)(y^2 - 1^2) =$

$(x - 2)(x + 2) \cdot (y - 1)(y + 1)$

β) $x^4 - 1 + x^3 - x =$

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

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

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

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

$(x - 1)(x + 1) \cdot (x^2 + x + 1)$

γ) $x^3(x^2 - 1) + 1 - x^2 =$

$x^3(x^2 - 1) - (x^2 - 1) =$

$(x^2 - 1)(x^3 - 1) =$

$(x - 1)(x + 1)(x - 1)(x^2 + x + 1)$

ΕΚΤΟΣ ΥΛΗΣ

δ) $(x^2 + 9)^2 - 36x^2 =$

$(x^2 + 9)^2 - 6^2x^2 = (x^2 + 9)^2 - (6x)^2$

$= (x^2 + 9 - 6x)(x^2 + 9 + 6x)$

$a^2 - 6^2$; $a = x^2 + 9$, $6 = 6x$

$= (x^2 - 6x + 9)(x^2 + 6x + 9)$

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

$a^2 - 2 \cdot a6 + 6^2$; $a^2 + 2 \cdot 6a + 6^2$

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

ε) $\alpha^2 - 2\alpha\beta + \beta^2 - \alpha + \beta$

στ) $x^2 - 2xy + y^2 - \omega^2$

ζ) $1 - \alpha^2 + 2\alpha\beta - \beta^2$

η) $y^2 - x^2 - 10y + 25$

ε) $\alpha^2 - 2\alpha\beta + \beta^2 - \alpha + \beta =$

$(\alpha-\beta)^2 - \alpha + \beta =$

$(\alpha-\beta)^2 - (\alpha-\beta)\cdot 1 =$

$(\alpha-\beta)(\alpha-\beta-1)$