

$$1) \text{Ker } \psi = \{ x \in G \mid \psi(x) = 1_H \}$$

$$2) \forall A \in G \quad A \cdot 1_H \cdot A^{-1} \in H \rightarrow \text{MA } \psi(H) \ni 1_H \rightarrow \psi(A \cdot 1_H \cdot A^{-1}) = \psi(A) \cdot \psi(1_H) \cdot \psi(A^{-1}) = \psi(A) \cdot 1_H \cdot \psi(A)^{-1} = 1_H$$

$$3) \mathbb{R}^3 \text{ BASE } 8 \rightarrow \text{POSSONO ESSERE INDIP.} \quad \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix} \in \begin{pmatrix} -1 \\ 0 \\ 1 \end{pmatrix} \text{ NON SONO INDIP.}$$

$$4) \text{UN AUTOVETTORE È UN VETTORE APP. A } V \text{ T.C. } T(\underline{v}) = \lambda \cdot \underline{v} \text{ CON } \lambda \text{ AUTOVAL ASSOCIATO}$$

2)

$$5) 17^{17 \cdot 16} \leq 17^{272} \quad (100) \quad 17 \in 100 \text{ COPRIMI} \rightarrow \text{TEOR. EULER} \quad A^{\varphi(N)} \equiv A(N)$$

$$\varphi(100) = 5^2 \cdot 2^2 = \varphi(25) \cdot \varphi(4) = 20 \cdot 2 = 40$$

$$1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24$$

$$272 = 40 \cdot 6 + 32$$

$$1, 3, 7, 9, 11, 13, 17, 19, 21, 23, 27, 29$$

$$\begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \end{pmatrix} \begin{pmatrix} 3 & 4 \\ 4 & 3 \end{pmatrix} \begin{pmatrix} 4 & 5 \\ 5 & 4 \end{pmatrix} \begin{pmatrix} 1 & 5 \\ 5 & 1 \end{pmatrix} \begin{pmatrix} 6 & 7 \\ 7 & 6 \end{pmatrix} \begin{pmatrix} 8 \\ 8 \end{pmatrix} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 2 & 3 & 4 & 5 & 6 & 7 & 8 & 1 \end{pmatrix} = \{ (2345)(67) \}$$

$$\text{ORDINE} = \text{MCM}(2, 6) = 6$$

$$6) \det \left(\begin{bmatrix} 0 & 0 & 0 & -1 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{bmatrix} - \begin{bmatrix} \lambda & 0 & 0 & 0 \\ 0 & \lambda & 0 & 0 \\ 0 & 0 & \lambda & 0 \\ 0 & 0 & 0 & \lambda \end{bmatrix} \right) = \det \begin{bmatrix} -\lambda & 0 & 0 & -1 \\ 0 & 1-\lambda & 0 & 0 \\ 0 & 0 & 1-\lambda & 0 \\ -1 & 0 & 0 & -\lambda \end{bmatrix} \rightarrow \text{LAPLACE 1ª RIGA}$$

$$-\lambda \cdot \det \begin{pmatrix} 1-\lambda & 0 & 0 \\ 0 & 1-\lambda & 0 \\ 0 & 0 & -\lambda \end{pmatrix} + 1 \cdot \det \begin{pmatrix} 0 & 1-\lambda & 0 \\ 0 & 0 & 1-\lambda \\ -1 & 0 & 0 \end{pmatrix} \rightarrow -\lambda (1-\lambda \cdot \det \begin{pmatrix} 1-\lambda & 0 \\ 0 & -\lambda \end{pmatrix}) + 1-\lambda \cdot \det \begin{pmatrix} 0 & 1-\lambda \\ -1 & 0 \end{pmatrix}$$

$$= -\lambda (1-\lambda (1-\lambda \cdot -\lambda)) + (1-\lambda) \cdot \det \begin{pmatrix} \lambda & 1-\lambda & -1 \end{pmatrix} = -\lambda (1-\lambda (-\lambda + \lambda^2)) + (1-\lambda) (-1 + \lambda)$$

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

$$= \lambda^4 - \lambda^3 - \lambda^2 + 2\lambda - 1$$

$$\text{RADICI: } 1, -1$$

$$\text{DIAGONALIZZABILE}$$

$$V_1 = \{ 1 \}$$

$$V_{-1} = \{ 1 \}$$

$$\begin{pmatrix} -1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ -1 & 0 & 0 & -1 \end{pmatrix} \rightarrow \begin{matrix} -x - y = 0 \\ -x - y = 0 \end{matrix} \quad \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 1 \end{pmatrix} \rightarrow \begin{matrix} x - y = 0 \\ x - y = 0 \\ x - y = 0 \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & -1 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \\ -1 & 0 & 0 \end{pmatrix} \rightarrow \begin{matrix} x - y = 0 \\ 2y = 0 \\ 2y = 0 \\ -x + y = 0 \end{matrix} \quad \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix}$$

$$17^{17^{16}} (100)$$

$$17^{32} (100)$$

$$17^{32} (25) \rightarrow 17^{32} (5) \rightarrow 2^{32} \rightarrow 1$$

$$\begin{array}{r} 17 \\ 16 \\ \hline 102 \\ 17 \\ \hline 272 \end{array}$$

$$e(100) = 40$$

$$\begin{array}{r} 17 \\ 17 \\ \hline 119 \\ 17 \\ \hline 289 \end{array}$$

$$\begin{array}{l} 1, 3, 7, 9 \\ 11, 13, 17, 19 \\ 21, 23, 27, 29 \end{array}$$

$$\begin{array}{r} 17 \\ 17 \\ \hline 102 \\ 17 \\ \hline 272 \end{array}$$

$$\begin{array}{r} 289 \rightarrow 89 \\ 175 \\ \hline 613 \\ 17 \\ \hline 793 \rightarrow 98 \\ 175 \\ \hline 1 \\ 1 \end{array}$$

$$3x + 25y = 1$$

$$25 \equiv 3 \cdot 8 + 1$$

$$17 \cdot 3 \equiv 51$$

$$15 \text{ RS}$$

$$A \sim B$$

$$B - A (-8)$$

$$(-8, 1)$$

$$(-8 + 25k) \equiv 17$$

$$T(v) = \lambda \cdot v \rightarrow T(v)$$

$$T: V \rightarrow V$$

$$v \rightarrow \lambda v$$

$$T(T(v)) = T(\lambda v) = \lambda \cdot \lambda \cdot v$$

$$V \rightarrow V \rightarrow V$$

$$v \rightarrow \lambda v \rightarrow v$$

$$\text{SE } T \circ T = T \rightarrow$$

$$V \rightarrow V \rightarrow V$$

$$\underline{v} \quad \underline{v} \quad \underline{v}$$

$$\underline{v} \equiv 1 \cdot \underline{w}$$

$$\underline{0v} \equiv 0 \cdot \underline{0w}$$

$$x \equiv 2 (9) \rightarrow 2 (9)$$

$$x \equiv 17 (25) \rightarrow 17 (25)$$

$$x \equiv 2 (15) \rightarrow 2 (15)$$

$$\begin{array}{r} 25 \\ 10 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 25 \\ 15 \\ \hline 10 \end{array}$$

$$(1+x) + (1-x)$$

$$5x + 9y = 1$$

$$9 \equiv 5 + 4 \rightarrow 4 \equiv (-1, 1)$$

$$5 \equiv 4 + 1 \rightarrow 15 (2, -1) \rightarrow (2 + 9k)$$

$$(2 + 9k)$$

$$6x + 25y = 17$$

$$6x + 25y = 1$$

$$25 \equiv 6 \cdot 4 + 1$$

$$(-4, 1) \rightarrow (-68, 17)$$

$$25 \equiv 6 \cdot 4 + 1$$

$$(-4, 1) \rightarrow (-4 + 25k) (-68 + 25k) = 75 - 68 = 7$$

$$\begin{aligned}
 5x \equiv 1(9) &\rightarrow x \equiv 2(9) \rightarrow x \equiv 2(9) \rightarrow x \equiv 2(9) \\
 3x \equiv 1(5) &\rightarrow x \equiv 2(5) \rightarrow x \equiv 2(5) \rightarrow x \equiv 2(5) \\
 x \equiv 2(5) &\rightarrow x \equiv 2(3) \rightarrow x \equiv 2(3) \rightarrow x \equiv 2(3) \\
 x \equiv 2(3) &\rightarrow x \equiv 2(3) \rightarrow x \equiv 2(3) \rightarrow x \equiv 2(3)
 \end{aligned}$$

$$\begin{aligned}
 5x+1 &\equiv 2 \\
 5x &\equiv 1 \rightarrow (1, -1) \\
 3x &\equiv 1 \rightarrow (-1, 1) \quad (-2, 2) \quad (-2+3k)
 \end{aligned}$$

$$KT = \{ P(x) \in R_2[x] \mid T(P(x)) = 0_v \}$$



$$x^2 + 2x + 1 \equiv (1+x)^2 + 2(1+x) + 1 + (1-x)^2 + 2(1-x) + 1 \equiv 1 + 2x + x^2 + 2 + 2x + 1 + 1 - 2x + x^2 + 2 - 2x + 1 \equiv 2x^2 + 4$$

$$\begin{aligned}
 5x \equiv 1(9) &\rightarrow x \equiv 2(9) \rightarrow 5x \equiv 2(9) \rightarrow 5x \equiv 2(9) \rightarrow 5x \equiv 2(9) \\
 3x \equiv 1(5) &\rightarrow x \equiv 2(5) \rightarrow 3x \equiv 2(5) \rightarrow 3x \equiv 2(5) \rightarrow 3x \equiv 2(5) \\
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 x &\equiv 2(3) \rightarrow x \equiv 2(3) \rightarrow x \equiv 2(3) \rightarrow x \equiv 2(3)
 \end{aligned}$$

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$$1+x \leq 1-x \leq 0 \rightarrow 1-1+x-x \leq 0 \rightarrow x-x \leq 1-1 \rightarrow$$

$$(1+x)(1-x) \leq 1 - \cancel{x} - \cancel{x} - x^2 = 1 - x^2$$

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

$$\begin{array}{l} x + y \leq 0 \rightarrow x \leq -y \\ y \leq 0 \\ z \leq 0 \\ -x + y \leq 0 \rightarrow x \geq y \end{array}$$

~~2~~ $\begin{array}{l} x \leq y \\ x \geq -y \end{array}$

solve SE $y = 0$

~~1~~ ~~1~~ ~~1~~

$$-1(141) + 2-2 \rightarrow -24-4 \leq -2$$

$$-y \leq 0$$

$$y \leq 0$$

$$z \leq 0$$

$$-x \leq 0$$