

# Додаток В

## (обов'язковий)

### Вивід сесії Maple

```
> with(casa):

‘      |__| ‘

‘      | |      Welcome to CASA 2.5 for Maple V.5‘

‘      |  /\|  |/\| ‘

‘      /=\__|  []  | ‘

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‘      |      \_\_      for Symbolic Computation (RISC-Linz), the‘

‘      \_\_  CASA 2.5  |      University of Linz, A-4040 Linz, Austria.‘

‘      |      |‘

‘      _|      |||      |      For help type '?casa' or '?casa,<topic>'.‘

‘__/_      |||      |_ ‘
```

Error, (in with) symbol or symbol::type expected in local list

```
> infolevel['casa/finite'] := 19:

> C1 := finiteCurve(x^3 + y^2 + y, finiteField(4));
      
$$C1 := x^3 + y z^2 + y^2 z$$


> H1 := GoppaPrimary(C1, "affine", 6):
      
$$G = +6 (0 : 1 : 0)$$

```

$$\begin{aligned} D = & [0, 0, 1] + [0, 1, 1] + [1, \alpha, 1] + [1, \alpha^2, 1] + [\alpha, \alpha, 1] + [\alpha, \alpha^2, 1] \\ & + [\alpha^2, \alpha, 1] + [\alpha^2, \alpha^2, 1] \end{aligned}$$

$$L(G) = \text{span}(1, \frac{y}{z}, \frac{y^2}{z^2}, \frac{x}{z}, \frac{xy}{z^2}, \frac{x^2}{z^2})$$

$$H = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & \alpha & \alpha^2 & \alpha & \alpha^2 & \alpha & \alpha^2 \\ 0 & 1 & \alpha^2 & \alpha & \alpha^2 & \alpha & \alpha^2 & \alpha \\ 0 & 0 & 1 & 1 & \alpha & \alpha & \alpha^2 & \alpha^2 \\ 0 & 0 & \alpha & \alpha^2 & \alpha^2 & 1 & 1 & \alpha \\ 0 & 0 & 1 & 1 & \alpha^2 & \alpha^2 & \alpha & \alpha \end{bmatrix}$$

$$G = \begin{bmatrix} 1 & 1 & 0 & 0 & \alpha^2 & \alpha^2 & \alpha & \alpha \\ 0 & 0 & 1 & 1 & \alpha & \alpha & \alpha^2 & \alpha^2 \end{bmatrix}$$

$$[n, k, d_{\Gamma}] = 8, 2, 6$$

$$\begin{aligned} &> \text{ c } := \text{GoppaEncode}([0, 1], \text{ H1}); \\ &\qquad c := [0, 0, 1, 1, \alpha, \alpha, \alpha^2, \alpha^2] \end{aligned}$$

$$\begin{aligned} &> \text{ c}[2] := 1; \text{ c}[8] := 0; \\ &\qquad c_2 := 1 \end{aligned}$$

$$c_8 := 0$$

> SV := GoppaPrepareSV(H1):

$$A = +\mathcal{B} \ (0 : 1 : 0)$$

$$C = +\mathcal{B} \ (0 : 1 : 0)$$

$$\psi = [1, \frac{y}{z}, \frac{x}{z}]$$

$$\chi = [1, \frac{y}{z}, \frac{x}{z}]$$

$$\psi * \chi = \begin{bmatrix} 1 & \frac{y}{z} & \frac{x}{z} \\ \frac{y}{z} & \frac{y^2}{z^2} & \frac{x y}{z^2} \\ \frac{x}{z} & \frac{x y}{z^2} & \frac{x^2}{z^2} \end{bmatrix}$$

> GoppaDecode(c, H1, SV);

$$S = \begin{bmatrix} \alpha & \alpha^2 & \alpha \\ \alpha^2 & 0 & 1 \\ \alpha & 1 & 1 \end{bmatrix}$$

$$\text{Nullspace}(S) = ([\alpha, \alpha, 1])$$

$$\text{error locations} = \{2, 3, 8\}$$

$$Error\ Value\ System : \begin{bmatrix} 1 & 1 & 1 \\ 1 & \alpha & \alpha^2 \\ 1 & \alpha^2 & \alpha \\ 0 & 1 & \alpha^2 \\ 0 & \alpha & \alpha \\ 0 & 1 & \alpha \end{bmatrix} * e = \begin{bmatrix} \alpha \\ \alpha^2 \\ 0 \\ \alpha \\ 1 \\ 1 \end{bmatrix}$$

$$e = [1, 0, \alpha^2]$$

$$c = [0, 0, 1, 1, \alpha, \alpha, \alpha^2, \alpha^2]$$

$$[0, 1]$$