

$$\mathcal{J}_4 = -X^2 \left\{ \begin{array}{l} \text{Diagram 1} \\ \text{Diagram 2} \end{array} \right\} - X \left\{ \begin{array}{l} \text{Diagram 3} \\ \text{Diagram 4} \end{array} \right\} - X^2 \left\{ \begin{array}{l} \text{Diagram 5} \\ \text{Diagram 6} \end{array} \right\} - X^3 \left\{ \begin{array}{l} \text{Diagram 7} \\ \text{Diagram 8} \end{array} \right\}$$

$$\mathcal{J}_4^2 = -(X^2 + X^4) \left\{ \begin{array}{l} \text{Diagram 9} \\ \text{Diagram 10} \end{array} \right\} - X^2 \left\{ \begin{array}{l} \text{Diagram 11} \\ \text{Diagram 12} \end{array} \right\} - X \left\{ \begin{array}{l} \text{Diagram 13} \\ \text{Diagram 14} \end{array} \right\} - (X + X^3) \left\{ \begin{array}{l} \text{Diagram 15} \\ \text{Diagram 16} \end{array} \right\} - (X^3 + X^5) \left\{ \begin{array}{l} \text{Diagram 17} \\ \text{Diagram 18} \end{array} \right\}$$

In the basis

$$\left(\begin{array}{cccccccccccccccc} \text{Diagram 19} & \text{Diagram 20} & \text{Diagram 21} & \text{Diagram 22} & \text{Diagram 23} & \text{Diagram 24} & \text{Diagram 25} & \text{Diagram 26} & \text{Diagram 27} & \text{Diagram 28} & \text{Diagram 29} & \text{Diagram 30} & \text{Diagram 31} & \text{Diagram 32} & \text{Diagram 33} & \text{Diagram 34} \end{array} \right)$$

this acts by right multiplication as

$$\left(\begin{array}{cccccccccccccccc} 0 & -X & -X^2 & -X^3 & 0 & 0 & 0 & 0 & 0 & -X & -X^2 & 0 & 0 & 0 \\ 0 & 1+X^2 & X+X^3 & X^2+X^4 & 0 & 0 & 0 & 0 & 0 & 0 & X^3 & 0 & 0 & 0 \\ 0 & -X & -X^2 & -X-X^3 & 0 & 0 & 0 & 0 & 0 & 0 & -X^2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1+X^2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -X^2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1+X^2 & X+X^3 & X^2+X^4 & 0 & 0 & 0 & 0 & 0 & X^3 & 0 \\ 0 & 0 & 0 & 0 & -X & -X^2 & -X-X^3 & 0 & 0 & 0 & 0 & 0 & -X^2 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & 0 & 0 & 0 & 0 & 0 & 0 & -X^2 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & X+X^3 & X^2+X^4 & X^3 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -X & -X^2 & -X-X^3 & -X^2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & 0 & -X^2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & X+X^3 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -X & -X^2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & X+X^3 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -X & -X^2 \end{array} \right)$$

and by left multiplication by

$$\left(\begin{array}{cccccccccccc} 0 & -X & -X^2 & -X^3 & 0 & 0 & 0 & 0 & 0 & -X & -X^2 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -X & 0 & 0 & -X^2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -X & 0 & 0 & -X^2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -X & -X^2 & 0 & 0 & 0 \\ 0 & X^4 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & 0 & 0 & X^3 & 0 & 0 & 0 \\ 0 & 0 & X^4 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & 0 & 0 & X^3 & 0 & 0 \\ 0 & 0 & 0 & X^4 & 0 & 0 & 0 & 0 & 0 & 1+X^2 & X^3 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & X^3 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & X^3 & 0 & 0 \end{array} \right)$$