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E2

$$(1) \underline{L}_2 = \begin{Bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{Bmatrix}$$

$$f = x^5 - x^4 + x - 1 = x^5 + x^4 + x + 1$$

$$g = x + 1$$

$$\begin{array}{r} x^5 + x^4 + x + 1 \\ x^5 + x^3 \hline x^4 + x^2 + x + 1 \end{array}$$

$$\begin{array}{r} x^4 + x^3 + x^2 + x + 1 \\ x^4 + x^2 \hline x^3 + x + 1 \\ x^3 + x \hline x + 1 \end{array}$$

$$\begin{array}{r} x^2 + 1 \\ x^3 + x^2 + x + 1 \hline x^2 + x + 1 \end{array}$$

$$\begin{array}{r} x^2 + 1 \\ x^2 + 1 \hline 0 \end{array}$$

$$g = x^3 + x^2 + x + 1$$

$$\underline{0}$$

$$-1 \cdot x^4 = (0-1)x^4$$

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

$$-1x^5 = (2-1)x^5$$

$$= x^5$$

$$x \cdot x = x^2$$

$$x + x = 2x$$

$$d) f = (x^2 + 1)^2 + 2(x^3 + 2) + 1 \cdot x^2 + 2x + 2$$

13j  $g = (x+1) + 1 = x^2 + 2x + 1 \Rightarrow f = x^4 + 2x^3 + 2x^2 + 2x + 2$

$$f = x^4 + 2x^3 + 2x^2 + 2x + 2 \quad \begin{array}{l} \underline{x^2 + 2x + 2} \\ x^4 + 2x^3 + 2x^2 + 2x + 2 \\ \hline \end{array}$$

$$g = x^2$$

$$r = 2$$

$$= x^4 = (0 - 1)x^4 = -x^4$$

$$= 2x^2 = x^2$$