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/ /

① a) $A = \begin{bmatrix} 1 & \alpha & 0 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{bmatrix}$ $\det A = \begin{vmatrix} 1 & \alpha & 0 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{vmatrix}$ (1 α / 0 1 / 0 −1) → 0 −1 +0 ; 1+0+0

$\det A = 1 - (-1) = 1 + 1 = \boxed{2}$

b) $\begin{vmatrix} 1 & 0 & 0 & 3 \\ \alpha & 1 & -1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{vmatrix}$

2+2=par 4+2=par

$\cancel{0 \cdot cof(b_{12})} + 1 \cdot cof(b_{22}) + \cancel{0 \cdot cof(b_{32})} + 1 \cdot cof(b_{42})$

$= 1 \cdot \begin{vmatrix} 1 & 0 & 3 \\ 0 & 0 & 3 \\ 0 & 1 & 4 \end{vmatrix} + 1 \cdot \begin{vmatrix} 1 & 0 & 3 \\ \alpha & -1 & 4 \\ 0 & 0 & 3 \end{vmatrix}$

(1 0 3 / 0 0 3 / 0 1 4) → 0 +3 +0 ; 0 +0 +0

(1 0 3 / α −1 4 / 0 0 3) → ~~0+0+0~~ ; 0+0+0 ; −3+0+0

$= -3 - 3 = \boxed{-6} = \det B$

② $\begin{vmatrix} x^2 & 0 & x & -1/10 \\ 7{,}5 & 0 & 5 & 2 \\ 10 & 0 & 4 & 2 \\ 1 & 1 & 1 & 1 \end{vmatrix} = 0$

4+2=par

$\cancel{0 \cdot (a_{12} + a_{22} + a_{32})} + 1 \cdot (a_{42})$

$1 \cdot \begin{vmatrix} x^2 & x & -1/10 \\ 7{,}5 & 5 & 2 \\ 10 & 4 & 2 \end{vmatrix}$ (x² x −1/10 / 7,5 5 2 / 10 4 2) → x² x ; 7,5 5 ; 10 4

$-5 + 8x^2 + 15x$

$\det = 10x^2 + 20x - 3 - (-5 + 8x^2 + 15x) = 0$ $\quad 10x^2 + 20x - 3$

$= 10x^2 - 8x^2 + 20x - 15x - 3 + 5 = 0$

$= 2x^2 + 5x + 2 = 0$

$a = 2 \quad b = 5 \quad c = 2$

$x_1 + x_2$

$(\ ) + (\ ) = -b/a = -2/5$

$(\ ) \cdot (\ ) = c/a = 2/2 = 1$

$\boxed{-0{,}5} \quad \boxed{-2}$

SÃO DOMINGO

(a22) $2+2=4$ par — $3+2=5$ impar

③
$$\begin{vmatrix} x & 0 & 0 & 3 \\ -1 & x & 0 & 0 \\ 0 & -1 & x & 1 \\ 0 & 0 & -1 & -2 \end{vmatrix}$$

$$x \cdot \begin{vmatrix} x & 0 & 3 \\ 0 & x & 1 \\ 0 & -1 & -2 \end{vmatrix} + (-1) \cdot \begin{vmatrix} x & 0 & 3 \\ -1 & 0 & 0 \\ 0 & -1 & -2 \end{vmatrix}$$

$0 + x - 0$

$x \cdot \begin{vmatrix} x & 0 & 3 \\ 0 & x & 1 \\ 0 & -1 & -2 \end{vmatrix}$ $\quad -2x^2 + 0 + 0$

$+ \quad (-1) \cdot \begin{vmatrix} x & 0 & 3 \\ -1 & 0 & 0 \\ 0 & -1 & -2 \end{vmatrix}$ $\quad 0 + 0 + 3$

$$\text{Det} = x(-2x^2 - (-x)) + (-1) \cdot 3 = x(-2x^2 + x) + 3 = \boxed{-2x^3 + x^2 + 3}$$

④
$$A = \begin{vmatrix} x & 1 & 0 & 0 & 0 \\ 0 & x & 1 & 0 & 0 \\ 0 & 0 & x & 1 & 0 \\ 0 & 0 & 0 & x & k \\ 0 & 0 & 0 & 1 & x \end{vmatrix}$$

$0 + 1kx + 0$

$x \cdot \left(x \cdot \begin{vmatrix} x & 1 & 0 \\ 0 & x & k \\ 0 & 1 & x \end{vmatrix} \right)$ $\quad x^3 + 0 + 0$

$$\det A = x(x \cdot (x^3 - kx)) = x^2(x^3 - kx) = x^5 - kx^3$$

$$F(x) = x^5 - kx^3 \rightarrow F(-2) = (-2)^5 - k \cdot (-2)^3 = 8$$

$$= -32 - k \cdot (-8) = 8$$

$$= -32 + 8k = 8 + 32$$

$$= k = \frac{40}{8} \quad \therefore \boxed{k = 5}$$