

1.1)

$$\det(A - \lambda I) = 0 \implies \lambda^2 - 5\lambda + 6 = 0$$

2 valeurs propres distinctes : 2 et 3

$$AV = 2V \implies x = y \implies V_1 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$AV = 3V \implies x = 2y \implies V_2 = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$$

$$P = \begin{pmatrix} 1 & 2 \\ 1 & 1 \end{pmatrix} \implies P^{-1} = \begin{pmatrix} -1 & 2 \\ 1 & -1 \end{pmatrix}$$

$$\tilde{A} = P^{-1} A P = \begin{pmatrix} 2 & 0 \\ 0 & 3 \end{pmatrix}$$

1.2)

$$A = P \tilde{A} P^{-1} \implies A^{10} = P \tilde{A}^{10} P^{-1}$$

$$\tilde{A}^{10} = \begin{pmatrix} 1024 & 0 \\ 0 & 59049 \end{pmatrix} \implies A^{10} = \begin{pmatrix} 117074 & -116050 \\ 58025 & -57001 \end{pmatrix}$$

2.1)

$$C^{-1} = -\frac{1}{2} \begin{pmatrix} 4 & -2 \\ -3 & 1 \end{pmatrix}$$

$$D = C^{-1} B = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$