

1. Find the inverse matrix of

$$A := \begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & -1 & 0 \end{pmatrix}.$$

2. Let A be an $(m \times n)$ -matrix whose columns are all linearly independent. Show that AA^T is invertible.
3. Consider the following Fibonacci sequence:

$$F_{n+2} = F_{n+1} + F_n$$

where $F_0 = 0$ and $F_1 = 1$. Find the explicit formula of F_n . (That is, represent F_n as a function of n .)