6D Inverse of 2×2 Matrices

$\boldsymbol{AA^{-1}}$ **= I**

1. For each of the matrices below, determine if they are singular and if they are not, find their inverse:

a) $\boldsymbol{A} = \begin{bmatrix} 3 & 2 \\ -1 & 1 \end{bmatrix}$

b) $\boldsymbol{B} = \begin{bmatrix} 2 & 1 \\ 2 & 1 \end{bmatrix}$

c) $\boldsymbol{C} = \begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}$

2. **A** and **B** are 2 x 2 non-singular matrices such that **BAB** = **I**.

a) Prove that $\mathbf{A} = \mathbf{B}^{-1}\mathbf{B}^{-1}$

b) Given that:

$$\boldsymbol{B} = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$$

Find the matrix **A** such that **BAB** = **I**