**6D Inverse of 2×2 Matrices**

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

1. For each of the matrices below, determine if they are singular and if they are not, find their inverse:
2. $A=\left[\begin{matrix}3&2\\-1&1\end{matrix}\right]$
3. $B=\left[\begin{matrix}2&1\\2&1\end{matrix}\right]$
4. $C=\left[\begin{matrix}1&3\\2&0\end{matrix}\right]$
5. **A** and **B** are 2 x 2 non-singular matrices such that **BAB** = **I**.
6. Prove that **A** = **B**-1**B**-1
7. Given that:

$$B=\left[\begin{matrix}2&5\\1&3\end{matrix}\right]$$

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