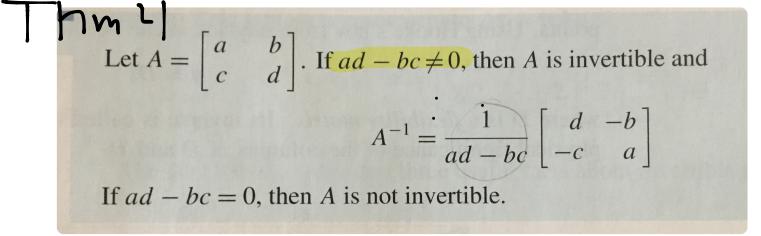


An *n* x *n* matrix A is called **invertible** if there is an *n* x *n* matrix C such that AC=I and CA=I. Then C is called the **inverse** of A and is written A.

A matrix which is NOT invertible is said to be singular and an invertible matrix is nonsingular.

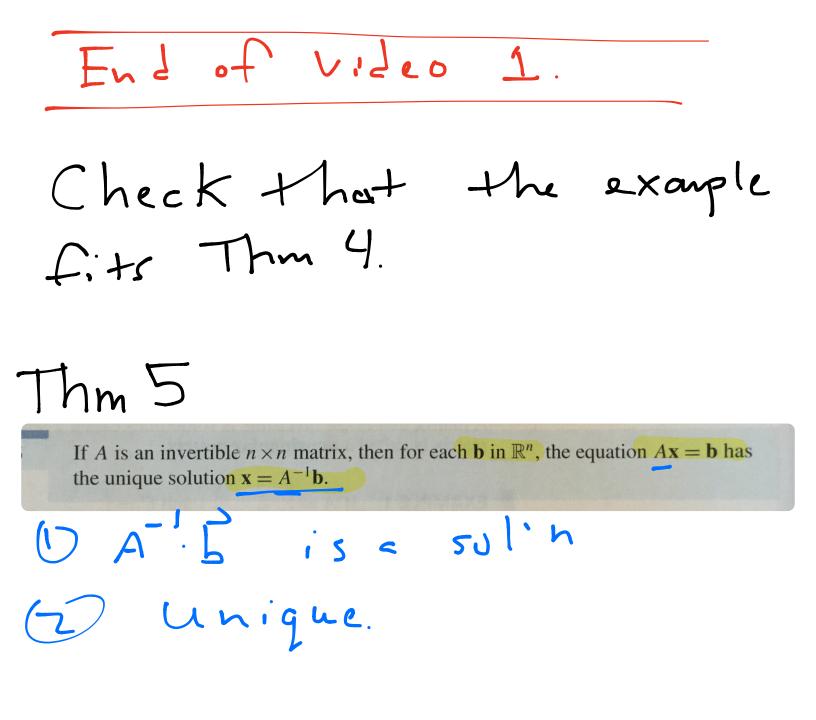
-2 3 C = A- 4 3 A- 7 2

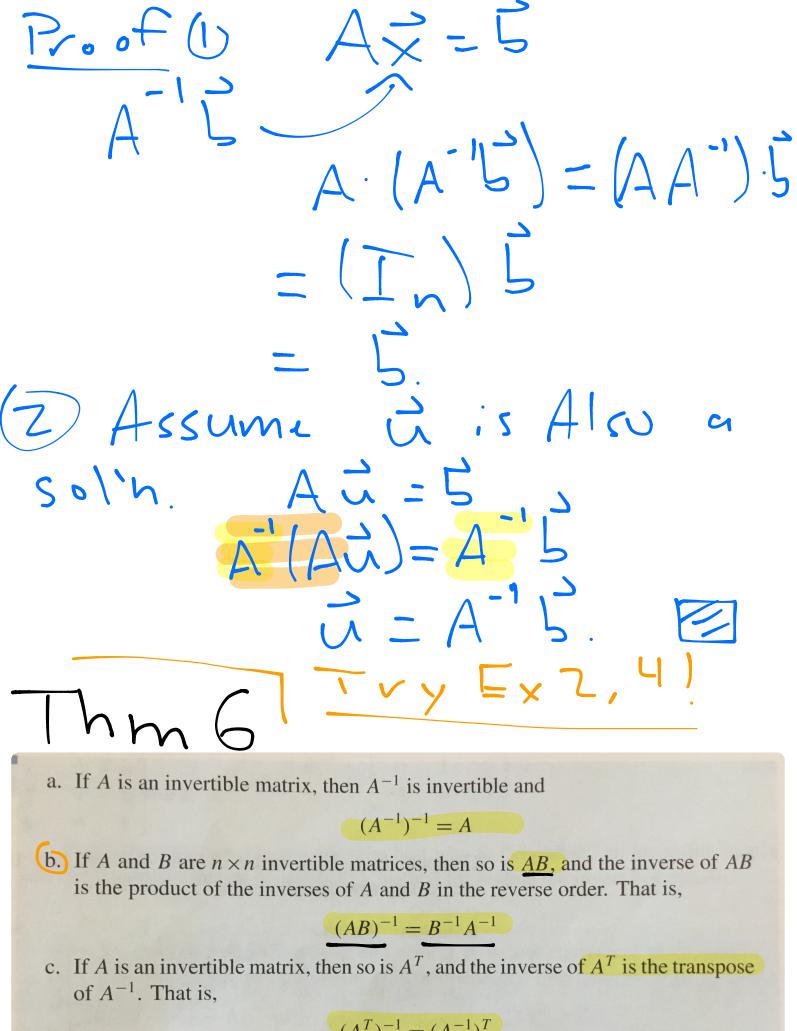
-



The quantity *ad-bc* is called the **determinant** of *A* and we write det *A* = *ad-bc*.

Note: this is only for a 2x2 matrix right now. We will expand this idea later.





 $(A^T)^{-1} = (A^{-1})^T$

Pt: Matrix , n Ver Ses areUngue: Assume Me have TWU and $A \cdot B = T = DA$ A : C = I = CAAB=I = $(AB) = C \cdot I$ (CA)B = C $T \cdot B = C$ \checkmark $\overline{D} = C$ + 0 Now, All I hove do, is show (AT) end B'A' are both o f AB. inverses

(AB)(AB) = T(ATS) (BA) $= A(T_3 T_5')A''$ $= A \cdot I \cdot A$ - AA'=> By our lemma that Inverses are Unique. (ATS)' = TJA'

Thm 7

An $n \times n$ matrix A is invertible if and only if A is row equivalent to I_n , and in this case, any sequence of elementary row operations that reduces A to I_n also transforms I_n into A^{-1} .

